

General Specifications

WE7000 PC-Based Measurement Instruments

GS 7070-00E

Table of Contents

WE400/WE800	Measuring Stations	2
WE7021	GP-IB Controller Module	5
WE7035/WE7036	Optical Interface Cards (for PC with PCI bus)	7
WE7037/WE7038	Optical Interface Modules	8
WE7052	Fast Ethernet Module	9
WE7111	100 MS/s Digital Oscilloscope Module	10
WE7116	2-CH, 20 MS/s Digitizer Module	12
WE7121	10 MHz Function Generator Module	14
WE7141	100 MHz Universal Counter Module	16
WE7235	4-CH 100 kS/s Accelerometer Module	19
WE7241	10-CH Digital Thermometer Module	22
WE7245	4-CH, 100 kS/s Strain Module	24
WE7251	10-CH, 100 kS/s Digitizer Module	27
WE7262	32-Bit Digital I/O Module	29
WE7271/WE7272	4-CH, 100 kS/s Isolated Digitizer Module	31
WE7275	2-CH, 1 MS/s Isolated Digitizer Module	33
WE7281/WE7282	4-CH, 100 kS/s D/A Module	35
WE7311	1 GS/s Digital Oscilloscope Module	38
WE7521	4-CH Timing Measurement Module	40
707821	Input Terminal Block	42
707823	16-Bit Digital Input Terminal Box	43
707824	16-Bit Digital Output Terminal Box	45
7078 31/7078 32/7078 33/7078 34	Optical Fiber Cables	47

WE400/WE800 Measuring Stations

■ Overview

The WE400 and WE800 measuring stations are mounting units for the measurement modules. They consist of a case, power supply, and CPU board (32-bit RISC processor), and are capable of identifying installed modules and controlling communication between the modules and PC. Additionally, measurement modules within the measuring stations can exchange trigger and time-base signals with external equipments.

■ Features

- Plug & Play support for measurement modules
- Small-size (the WE400 footprint is roughly the size of a sheet of A4 paper)
- 32-bit CPU for controlling operations
- High-speed fiber optic interface (sold separately)
- Remote power ON/OFF function (when using fiber optic interface)
- expandable
- Inexpensive

■ Functions

- Automatic recognition of measurement modules
- Automatic module linking function
- Trigger and time-base signal I/O

■ Standard Specifications

- Module insertion slots
Number of slots
WE400: 4 for measurement modules and 1 for communication interface module
WE800: 8 for measurement modules and 1 for communication interface module
Internal bus: WE bus (original bus)
 - Triggers and time-base (within WE bus)
Trigger sources: TRIG IN input, communication, measurement modules, EXT I/O input
Number of bus triggers: 2 (BUSTRG1 and BUSTRG2)
Time base sources: TRIG IN input, communication, measurement modules, EXT I/O input
Number of time bases: 1 (CMNCLK)
 - Signal I/O
TRIG IN
Connector type: BNC
Pulse width: Minimum 100 ns or more
Detection level: High active/Low active
Input impedance: About 47 k Ω
Input level: CMOS level
Maximum allowable input voltage: -3 V to +8 V (see Note 1)
- * Able connected to bus trigger (BUSTRG1/BUSTRG2) or time base (CMNCLK).



WE400

EXT. I/O

Connector type: 9-pin D-sub type (female)

Input/output level: CMOS level

Trigger I/O: Bus trigger (BUSTRG1/BUSTRG2) (input/output selectable)

Input impedance: About 47 k Ω

Maximum allowable input voltage: -3 V to 8 V (see Note 1)

Output impedance: About 100 Ω

Maximum output current: ± 3.2 mA

Clock I/O: Common clock(CMNCLK) (input/output selectable)

Input impedance: About 47 k Ω

Maximum allowable input voltage: -3 V to +8 V (see Note 1)

Output impedance: About 100 Ω

Maximum output current: ± 3.2 mA

Event output: User-defined event signal (Condition displayed on LED on the front panel)

Output impedance: About 100 Ω

Maximum output current: ± 3.2 mA

Bus active output: Indicates that the measuring station is in operation (High level)

Output impedance: About 100 Ω

Maximum output current: ± 3.2 mA

• Serial communication

Electrical specifications: Conforms with EIA RS-232.

Connection method: Point to point

Communication method: Full duplex

Synchronization mode: Start-stop synchronization

Start bit: 1 bit fixed

Data length: 8 bits

Parity: None

Stop bit: 1 bit

Connector type: 9-pin D-sub (male)

Baud rates: 9600, 19200, 38400 bps (switch between rates using commands)

■ General Specifications:

- Safety standards
Complies with CSA C22.2 No.1010.1 and EN61010-1.
Overvoltage categories: CAT I and CAT II
Pollution degree: 1 and 2
 - Standard operating conditions
Ambient temperature: $23 \pm 2^{\circ}\text{C}$
Ambient humidity: $50 \pm 10\%$ RH
Power voltage/frequency fluctuation: $\pm 1\%$ of rating
 - Operating conditions
Operating temperature range: 5 to 40°C
Operating humidity range: 20 to 80% RH
(maximum wet-bulb temperature of 29°C ; no condensation)
 - Storage environment
Storage temperature range: -20 to 60°C
Storage humidity range: 20 to 80% RH
 - Operating altitude: Maximum 2000 meters (6560 ft)
 - Storage altitude: Maximum 3000 meters (9840 ft)
 - Rated supply voltage: 100 to 120 VAC or 200 to 240 VAC (automatic switching)
 - Permitted supply voltage range: 90 to 132 VAC or 180 to 264 VAC
 - Rated supply frequency: $50/60$ Hz
 - Permitted supply voltage frequency: 48 to 63 Hz
 - Maximum power consumed (see Note 2)
WE400: 140 VA (without modules) With maximum load: 350 VA
WE800: 180 VA (without modules) With maximum load: 550 VA
 - High frequency current from power supply: Conforms to IEC1000-3-2.
 - External dimensions
WE400: Approx. $213\{8.39\}$ (W) \times $266\{10.47\}$ (H) \times $360\{14.17\}$ (D) mm{inch} (projections excluded)
WE800: Approx. $360\{14.17\}$ (W) \times $266\{10.47\}$ (H) \times $360\{14.17\}$ (D) mm{inch} (projections excluded)
 - Weight
WE400: Approx. $6.5\{14.30\}$ kg{lb} (not including modules)
WE800: Approx. $11\{24.20\}$ kg{lb} (not including modules)
 - Cooling method: Forced air cooling
 - Installation position: Horizontal
 - Accessories: One power cord, WE7000 control software setup disk (one CD-ROM disk), D-sub connector for EXT I/O (9-pin male), cover plates (five for WE400, nine for WE800)
- Note 1: Overvoltage category CAT I and CAT II
Note 2: The power efficiency and power factor of the measuring stations change when modules are installed. Therefore the consumed power may not be the sum of the power consumed by each module.

AVAILABLE MODELS

Model	Suffix Codes	Name/Description
707001		WE400 Measuring Station (4 slots)
707002		WE800 Measuring Station (8 slots)
	-0	100 to 240 VAC
	-D	UL, CSA Standard
	-F	VDE Standard
	-R	SAA Standard
	-Q	BS Standard
	/HE	English Help

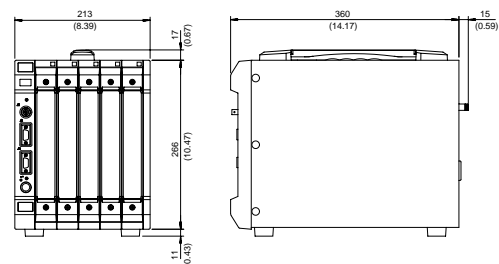
Accessories (sold separately)

Accessory	Model	Specifications	Order quantity
Serial communication cable	707801	9-pin to 9-pin	1
Rack mount bracket	707861	For 707001 standalone installation	1
Rack mount bracket	707862	For 707001 ganged installation	1
Rack mount bracket	707863	For 707002	1

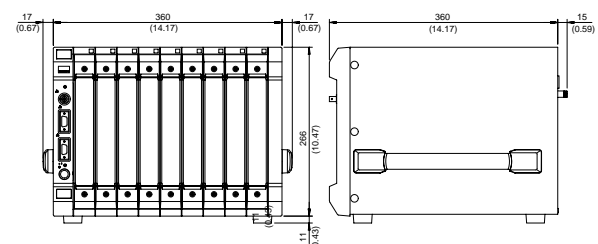
■ Dimensions

WE400

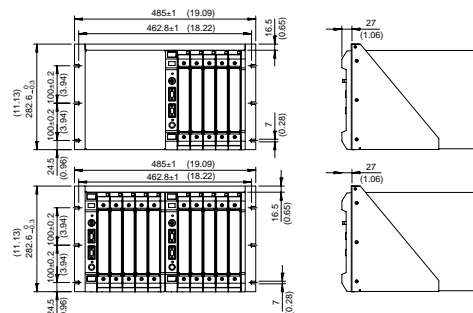
Unit: mm (inch)



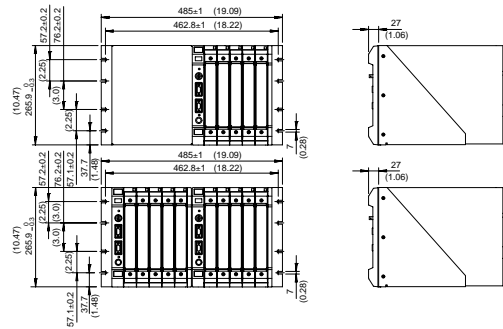
WE800



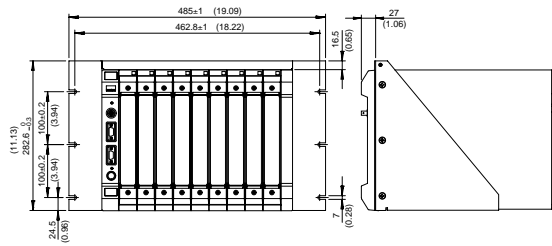
WE400 JIS Rack



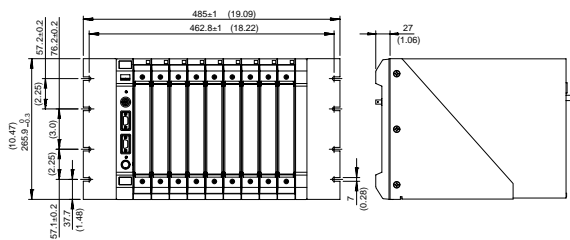
WE400 EIA Rack



WE800 JIS Rack



WE800 EIA Rack



WE7021

GP-IB Controller Module

■ Overview

The WE7021 GP-IB controller module is installed in a measuring station to control equipment provided with a GP-IB interface. The module, however, is not designed for connecting the measuring station with a personal computer.

■ Features

- Allows GP-IB instruments to be used in combination with WE7000 series modules
- Can be combined with an optical communication interface or an Ethernet interface to control remote GP-IB instruments
- Enables control of Yokogawa's 7555 digital multimeter and WT130 digital power meter using WE7000 control software



WE7021

■ Performance Specifications

Electrical/Mechanical Specifications

Conforms to IEEE St'd 488-1978 (JIS C 1901-1987)

Functional Specifications

Function	Subset Name	Description
Source handshake	SH1	All transmission handshaking functions available
Acceptor handshake	AH1	All reception handshaking functions available
Talker	T6	Basic talker functions, serial polling, talker release function using MLA (My Listen Address) is available.
Listener	L4	Basic listener functions, listener release function using MTA (My Talk Address) is available, no listen only function.
Service request	SR0	No service request function
Remote/local	RL0	No remote/local function
Parallel polling	PP0	No parallel polling function
Device clear	DC0	No device clear function
Device trigger	DT0	No device trigger function
Controller	C1, C2, C3, C4, C28	C1: controller, C2: IFC transmission/controller charge, C3: REN transmission, C4: Response to SRQ, C28: Interface message transmission functions available.
Electrical characteristics	E1	Open collector

Used code: ISO (ASCII) code

Protocol: Conforms to IEEE-St'd 488.2

Transfer format: IEEE-488 (GP-IB)

Signal logic:

Negative logic

"L" level : 0.8 V or less

"H" level: 2.0 V or more

Total cable length: 20 m or less

Cable length between devices: 4 m or less

Number of connections: 15 devices or less

■ General Specifications

Operating conditions: Same as that of the measuring station

Storage conditions

Temperature: -20 to 60°C

Humidity: 20 to 80% RH (no condensation)

Power consumption: 1 VA (Typical value at 100 V/50 Hz (see Note))

External dimensions: Approx. 33{1.3}(W) × 243{9.54}(H) × 232{9.12}(D)
mm{inch} (projections excluded)

Weight: Approx. 0.6{1.32} kg{lb}

Number of used slots: 1

Standard accessory: User's Manual (1)

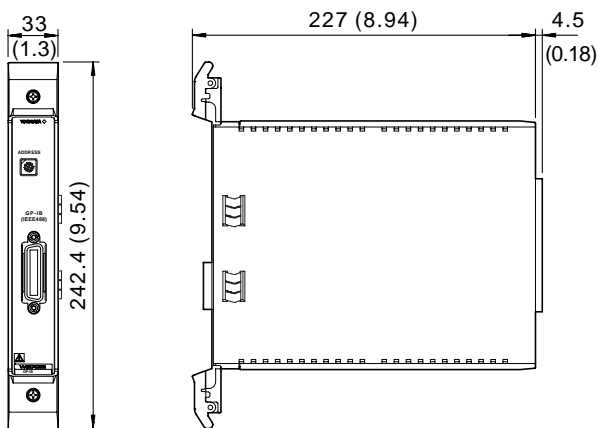
Note: Typical value represents a typical or average value.
It is not strictly guaranteed.

AVAILABLE MODEL

Model	Description
707021/HE	GP-IB Controller Module

■ Dimensions

Unit: mm (inch)



WE7035/WE7036

Optical Interface Cards

(for PC with PCI bus)

Overview

The WE7035 and WE7036 optical interface cards are installed in a Windows PC with an PCI bus to allow high speed communication between measuring stations and PC. These cards contain a CPU (32-bit RISC CPU) which controls communication.

Features

- High-speed data communication (250 Mbps) using optical fiber cable
- Maximum cable length: 500 meters (1640 ft)
- High electromagnetic immunity
- The two-port version (WE7036) allows multiple stations to be connected in a daisy chain, or in a ring.

Functions

- Remote ON/OFF control of main power on measurement station
- Auto-configuration

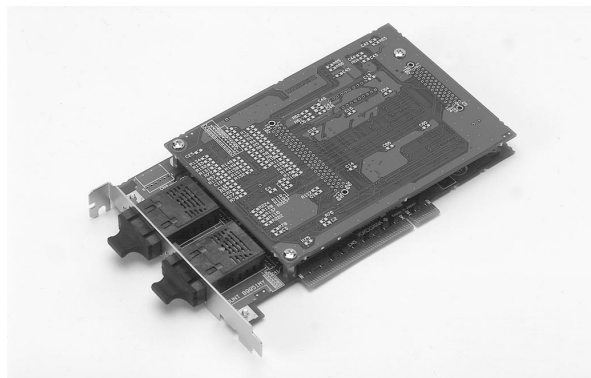
Specifications

- Number of interface ports: 1 on WE7035, 2 on WE7036
- Light source: 1300-nm LED
- Connection method: Optical fiber with dual SC connector (plural stations are connected in daisy chain)
- Transmission rate: 250 Mbps
- Cable length between stations: Maximum 500 meters (1640 ft) (using optical fiber cable specified by Yokogawa)
- Number of stations that can be connected: 3 stations or less
- Connection fiber: Duplex multimode optical fiber with dual SC connector (graded index silica multimode optical fiber, core diameter; 50 μm or 62.5 μm , cladding diameter; 125 μm)
- Slot: 1 PCI bus expansion slot (full size)

General Specifications

- Operating condition
 - Operating temperature range: 5 to 40°C
 - Operating humidity range: 20 to 80% RH (no condensation)
- Storage environment
 - Storage temperature range: -20 to 60°C
 - Storage humidity range: 20 to 80% RH
- Current consumption: 1.4 A (typical (see Note))
- Source voltage: 5 V \pm 10%
- External dimensions: Approx. 22{0.94} (W) \times 126{5.04} (H) \times 195{11.97} (D) mm{inch} (projections excluded)
- Weight: Approx. 0.3{0.66} kg{lb}

Note: Typical value represents a typical or average value.
It is not strictly guaranteed.



WE7036

AVAILABLE MODELS

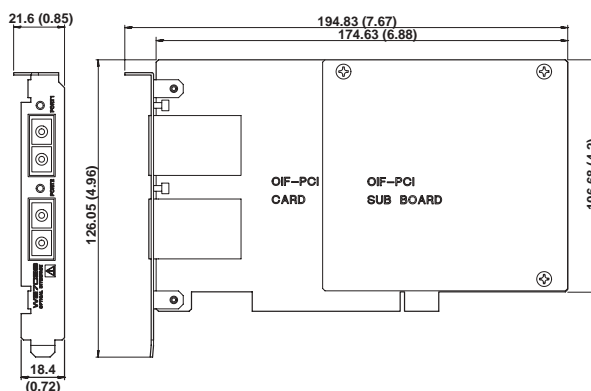
Model	Description
707035	Optical Interface Card (PCI bus, 1 port)
707036	Optical Interface Card (PCI bus, 2 ports)

Accessories (sold separately)

Accessory	Model	Specifications	Order quantity
Optical fiber cable	707831	Length: 2 meters	1
Optical fiber cable	707832	Length: 5 meters	1
Optical fiber cable	707833	Length: 10 meters	1
Optical fiber cable	707834	Length: 1 meter	1
Extension connector	707802	For optical fiber cable	1

Dimensions (WE7036)

Unit: mm (inch)



WE7037/WE7038

Optical Interface Modules

(for measuring stations)

■ Overview

The WE7037/WE7038 optical interface modules are installed to a measuring station to enable high-speed communication between the station and a PC. These modules contain a 32 bit RISC CPU that controls communication.

■ Features

- High-speed communication (250 Mbps) using optical fiber cable
- Maximum cable length: 500 meters (1640 ft)
- High electromagnetic immunity
- The two-port version (WE7038) allows multiple stations to be connected in a daisy chain.

■ Functions

- Remote ON/OFF control of module power on measurement station
- Auto-configuration

■ Standard Specifications

- Number of interface ports: 1 on WE7037, 2 on WE7038
- Light source: 1300-nm LED
- Connection method: Optical fiber with dual SC connector (plural stations are connected in daisy chain)
- Transmission rate: 250 Mbps
- Cable length between stations: Maximum 500 meters (1640 ft) (using optical fiber cable specified by Yokogawa)
- Number of stations that can be connected: 3 stations or less
- LED display: Communication status, station power status
- Connection fiber: Duplex multimode optical fiber with dual SC connector (graded index silica multimode optical fiber, core diameter; 50 μm or 62.5 μm , cladding diameter; 125 μm)
- Control bus: WE bus

■ General Specifications

- Operating condition: same as that of the measuring station.
- Storage conditions
 - Storage temperature range: -20 to 60°C
 - Storage humidity range: 20 to 80% RH
- Power consumption: 11 VA (typical at 100 V/50 Hz (see Note))
- External dimensions: Approx. 33{1.30} (W) \times 243{9.57} (H) \times 232{9.13} (D) mm{inch} (projections excluded)
- Weight: Approx. 0.7{1.54} kg{lb}
- Number of dedicated slots: 1
- Accessories: User's manual (1)

Note: Typical value represents a typical or average value.
It is not strictly guaranteed.



WE7038

AVAILABLE MODELS

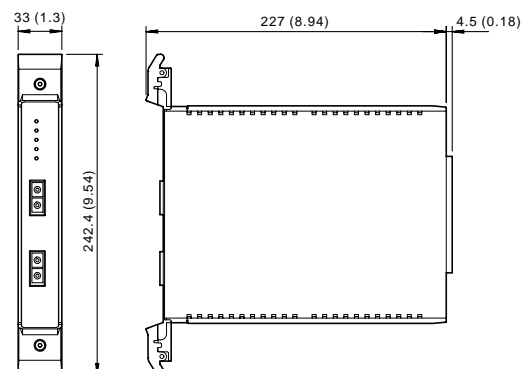
Model	Description
707037	WE7037 Optical Interface Module (1 port)
707038	WE7038 Optical Interface Module (2 port)

Accessories (sold separately)

Accessory	Model	Specifications	Order quantity
Optical fiber cable	707831	Length: 2 meters	1
Optical fiber cable	707832	Length: 5 meters	1
Optical fiber cable	707833	Length: 10 meters	1
Optical fiber cable	707834	Length: 1 meter	1
Extension connector	707802	For optical fiber cable	1

■ Dimensions (WE7038)

Unit: mm (inch)



WE7052

Fast Ethernet Module

■ Overview

The WE7052 Ethernet module is a communication module that is installed in a measuring station to enable connection between the station and a personal computer through an Ethernet (100BASE-TX/10BASE-T).

The module contains a CPU (32-bit RISC processor) to carry out communication control.

■ Features

- Enables a measuring station to be connected to a personal computer over the Ethernet
- Equipped with a 100BASE-TX/10BASE-T Ethernet port
- Two or more WE7052 modules can be connected using a HUB

■ Performance Specifications

Number of communication ports: 1

Connection format: Ethernet (100BASE-TX or 10BASE-T)

Transfer rate: 100 Mbps/10 Mbps

Transfer Mode: Select full duplex or half duplex

Communication protocol: TCP/IP (UDP/IP)

Number of measurement stations that can be controlled from a single PC: 3 stations or less

LED indication: Communication status, transfer speed
Communication format, link status, power status of the measuring station

■ General Specifications

Operating conditions: Same as those of the measuring station

Storage conditions

Temperature: -20 to 60°C

Humidity: 20 to 80% RH (no condensation)

Power consumption: Approx. 5 VA (Typical value at 100 V/50 Hz (see Note))

External Dimensions: Approx. 33{1.3} (W) × 243{9.54} (H) × 232{9.12} (D) mm{inch} (projections excluded)

Weight: Approx. 0.6{1.32} kg{lb}

Number of used slots: 1

Standard accessory: User's Manual (1)

Note: Typical value represents a typical or average value. It is not strictly guaranteed.

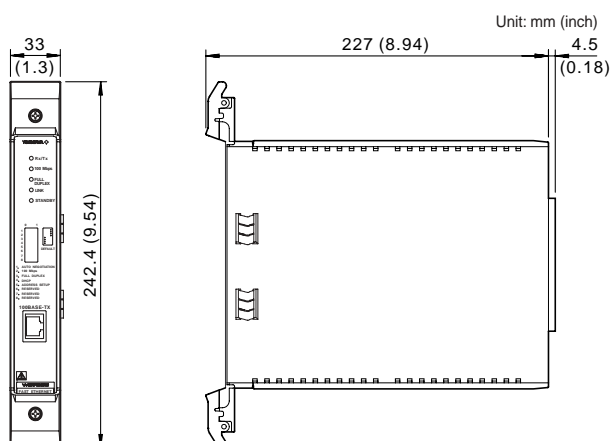


WE7052

AVAILABLE MODELS

Model	Description
707052	Fast Ethernet Module

■ Dimensions



WE7111

100 MS/s Digital Oscilloscope Module

■ Overview

This module contains a digital oscilloscope with a range of basic functions. Its flash memory contains setup information required for module operations, such as ranges, time axes, and triggers. The setup information is transferred to the PC when the module is connected. The WE7111 can also be used for temporary processing of measurements.

■ Features

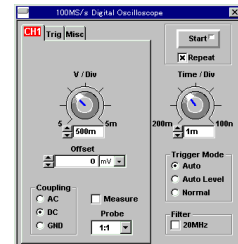
- 100 MS/s, A/D 8-bit resolution
- 40 MHz analog bandwidth (real time samples only)
- 100 kWord memory

■ Functions

- Maximum waveform signal sampling rate: 100 MS/s
- Synchronized operations between adjacent WE7111 modules
- High speed waveform display

■ Standard Specifications

- Measurement input section
 - Number of input channels: 1
 - Input coupling: AC, DC, GND
 - Connector type: BNC
 - Input impedance: $1\text{ M}\Omega \pm 1.5\%$, about 25 pF
 - Voltage sensitivity setting range: 5 mV/div to 5 V/div (1-2-5 steps)
 - Maximum input voltage (when frequency is 1 kHz or less): 250 V (DC + AC peak) or 177 VACrms (see Note 1)
 - Maximum DC offset setting range (when probe attenuation is set to 1:1):
 - 5 mV/div to 50 mV/div: $\pm 1\text{ V}$
 - 100 mV/div to 500 mV/div: $\pm 10\text{ V}$
 - 1 V/div to 5 V/div: $\pm 100\text{ V}$
 - Voltage accuracy (see Note 2)
 - DC accuracy
 - At 100 mV/div: $\pm(1.5\% \text{ of } 8 \text{ div} + 1 \text{ LSB})$
 - At other voltage axes: $\pm(2.5\% \text{ of } 8 \text{ div} + 1 \text{ LSB})$
 - Offset voltage accuracy (see Note 2)
 - 5 mV/div to 50 mV/div: $\pm(2.5\% \text{ of setting} + 0.2 \text{ mV})$
 - 100 mV/div to 500 mV/div: $\pm(1\% \text{ of setting} + 2 \text{ mV})$
 - 1 V/div to 5 V/div: $\pm(2.5\% \text{ of setting} + 20 \text{ mV})$
 - Frequency characteristic (for sinewave input with amplitude equivalent to $\pm 4 \text{ div}$):
 - DC up to 40 MHz (-1.5 dB attenuation point (typical value (see Note 4)))
 - Low frequency -3 dB attenuation point during AC coupling (see Note 2):
 - Maximum 10 Hz (maximum 1 Hz when using separately sold 150 MHz passive probe (model 700998))
 - Skew between modules (when operating with linked modules) (see Note 2):



WE7111

2 ns per each module (typical value when settings are all the same (see Note 4))

Residual noise level (see Note 3): Larger of the two $\pm 0.7 \text{ mV}$ or $\pm 0.12 \text{ div}$ (typical value (see Note 4))

Isolation between channels (when voltage sensitivities are all the same, DC to 40 MHz, linked modules): -40 dB (typical value (see Note 4))

A/D conversion resolution: 8 bits (25 LSB/div)

Probe attenuation settings: 1:1, 10:1, 100:1, 1000:1

Bandwidth limit: 20 MHz bandwidth limit can be turned on and off.

Maximum sampling rate: 100 MS/s

Maximum record length: 100 kWords (word = data-point)

• Trigger section

Trigger sources: Input signal (including input signals from linked WE7111 digital oscilloscope modules), commercial power signal, WE bus trigger (BUSTRG1/BUSTRG2) signals

Bus trigger (BUSTRG1/BUSTRG2) signal output sources: When an input signal or commercial power signal is selected as the trigger source, the sensed trigger can be output.

Trigger type: Edge trigger

Trigger modes:

AUTO: If the trigger does not occur for more than about 100 ms, the waveform is automatically acquired.

AUTO LEVEL: If the trigger does not occur for more than about 100 ms, the trigger level is automatically set to the amplitude midpoint and the trigger is activated.

NORMAL: The waveform is acquired only when the trigger occurs.

Trigger slopes: Rise, fall, both

Trigger coupling: Select either DC or AC for the trigger source.

HF rejection: Bandwidth limiting (DC up to about 15 kHz) on trigger sources can be turned on and off.

Trigger level (see Note 5)

Setting range: Voltage corresponding to ± 10 div of voltage axis sensitivity

Setting resolution: 1/50 div

Accuracy: $\pm(1 \text{ div} + 10\% \text{ of trigger level})$

Trigger sensitivity (see Note 5) (see Note 6) (when trigger source frequency is DC to 40 MHz): 1 div_{p-p}

Trigger position:

Setting range: +5.0 div to -5.0 div

Setting resolution: 0.1 div

Trigger delay setting range: 0 to 9.9999999 s

Trigger hold-off setting range: 200 ns to 9.9999999 s

- Time axis

Time axis setting range: 100 ns/div to 200 ms/div

Time axis accuracy (see Note 2): $\pm(0.01\% \text{ of reading} + 500 \text{ ps})$

External clock input (EXT CLOCK IN)

Connector type: BNC

Maximum input voltage: -3 to +8 V (see Note 1)

Input frequency range: 40 Hz to 15 MHz (continuous clock only)

Input level: TTL level

Minimum pulse width: 25 ns for both high and low

Input type: Non-isolated unbalanced (with 4.7 k Ω pull-up resistance)

- Functions

Auto-setup:

Automatically sets voltage axis, time axis, trigger level.

Initialization: Restores the default settings.

Calibration: Auto-calibration and manual calibration available

Acquisition modes: Select from normal, envelope and averaging.

Record length: 1 kWord, 5 kWords, 10 kWords, 30 kWords, 100 kWords (100 kWords cannot be set in averaging mode)

Input filter: 20 MHz bandwidth limit

Calibration signal output: Square wave (about 1 kHz, about 1 V_{p-p})

General Specifications

Standard operating conditions

Ambient temperature: 23 \pm 2°C

Ambient humidity: 50 \pm 10% RH

Source voltage/frequency tolerance: $\pm 1\%$ of rating (after warm-up time has passed)

Warm-up time: Minimum 30 minutes

Operating conditions: Same as that of the measuring station

Storage conditions

Storage temperature range: -20 to 60°C

Storage humidity range: 20 to 80% RH (no condensation)

Power consumption: 15 VA (typical value at 100 V/50 Hz, (see Note 4))

External dimensions: Approx. 33{1.30} (W) \times 243{9.57} (H) \times 232{9.13} (D) mm{inch} (projections excluded)

Weight: Approx. 0.9{1.98} kg{lb}

Number of dedicated slots: 1

Accessories: User's manual (1)

Note 1: Overvoltage categories CAT I and CAT II

Note 2: Value measured under standard operating conditions after calibration with the time base set to internal.

Note 3: Value when the input section is shorted, record length: 10 kWord, acquisition mode: normal mode, accumulate: OFF, probe attenuation: 1:1.

Note 4: Typical value represents a typical or average value. It is not strictly guaranteed.

Note 5: Value measured under standard operating conditions after calibration with the trigger signal set to a signal with a rate of change within 10 div/ μ s and amplitude within ± 5 div under the following settings;

Trigger mode: normal, Trigger level: within 60% of the amplitude of the trigger signal, HF rejection: OFF

Note 6: Value measured with the voltage sensitivity set to 50 mV/div when a pulse with amplitude 5 div p-p, and rising time of 1 ns is input.

Trigger coupling: DC, HF rejection: OFF

AVAILABLE MODEL

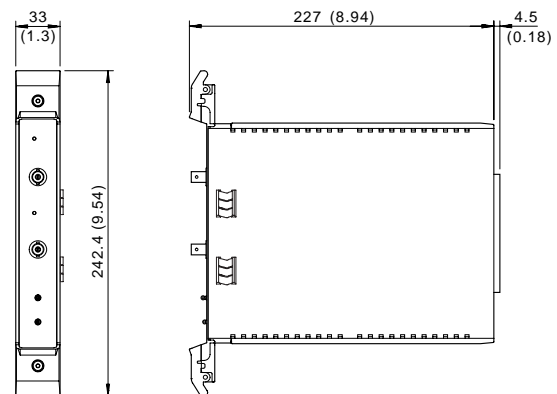
Model	Description
707111/HE	100 MS/s Digital Oscilloscope Module

Accessories (sold separately)

Accessory	Model	Specifications	Order quantity
150 MHz passive probe	700998	Band: 150 MHz	1
Miniclip converter	B9852CR	Probe accessory (one/unit)	1
BNC adapter	B9852CS	Probe accessory (one/unit)	1
Ground lead	B9852CT	Probe accessory (one/unit)	1
50 Ω terminal equipment	700976	Through-type	1

Dimensions

Unit: mm (inch)



WE7116

2-CH, 20 MS/s Digitizer Module

Overview

The WE7116 2-channel 20 MS/s digitizer module can convert the analog signals of 2 channels to digital signals at a maximum speed of 20 MHz. Equipped with two A/D converters, the module can sample data through two channels simultaneously at 20 MHz.

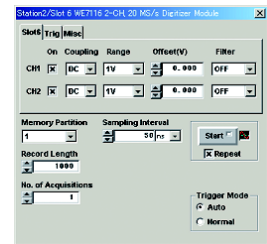
Two or more modules can be mounted side by side to enable synchronous operation.

Features

- 20 MS/s sampling and 12-bit A/D conversion of both channels simultaneously
- Acquisition by using the external timebase and external trigger is possible
- Operates in sync with an adjacent WE7116 module
- Built-in 4MWords acquisition memory for each channel

Performance Specifications

Number of input channels: 2
 Input format: Non-isolated, unbalanced
 Connector type: BNC
 Input coupling: DC/AC/GND
 Measurement range: $\pm 100\text{mV}$ to $\pm 50\text{V}$ (1-2-5 steps)
 A/D resolution: Equivalent to 12 bits (includes the sign)
 Input impedance: Approx. $1\text{M}\Omega$ (approx. 28pF)
 Maximum source resistance: 100Ω or less
 Frequency characteristics (-3dB attenuation point, during filter off)
 DC coupling: DC to 8 MHz (typical value (see Note 1))
 AC coupling: 5 Hz to 8 MHz (typical value (see Note 1))
 DC accuracy (see Note 2): $\pm 0.75\%$ of full scale
 Offset voltage setting range: 200% of lower limit of range to 200% of upper limit of range
 Offset voltage setting resolution: 0.05% of full scale
 Offset voltage accuracy (see Note 3): $\pm 0.5\%$ of setting
 Input filter:
 Low-pass filter
 Cut-off frequency: OFF/500kHz/1MHz
 Filter characteristics: 5th order elliptic filter
 Attenuation characteristics:
 -24 dB at frequency of 1.4 times the cut-off frequency
 -40 dB at frequency of 2.0 times the cut-off frequency (typical value (see Note 1))
 Acquisition method: Trigger only (Normal/Auto) (see Note 4)
 Memory length of acquisition memory: 4MWord for each channel
 Memory partition: Select from 1/2/4/8/16/32/64/128/256/512/1024
 Timebase source: Module's internal clock, external clock, or the time base signal (CMNCLK) of the measuring station (WE bus)



WE7116

Sampling interval: 50 ns to 1 ms, 50 ns steps
 External clock input:
 Input format: Non-isolated unbalanced
 Input level: TTL level
 Input resistance: $10\text{ k}\Omega$ (typical value (see Note 1))
 Connector type: BNC
 Input frequency range: 10 kHz to 20 MHz (continuous clock only)
 Minimum pulse width: 20 ns or more for both H and L
 Trigger source: Input signal, bus trigger(BUSTRG1/BUSTRG2) signal of the measuring station, commercial power signal
 Bus trigger signal (BUSTRG1/BUSTRG2) output source:
 Able to output the trigger detected from the input signal
 Trigger level:
 Setting range: 5% to 95% of full scale
 Resolution: 0.5% of full scale
 Hysteresis width: 3% or 10% of full scale (typical value(see Note 1))
 Trigger type: Edge trigger, window trigger
 Amount of pretrigger: 0 to (the record length - 2)
 External trigger input:
 Input format: Non-isolated, unbalanced
 Input level: TTL level
 Input resistance: $10\text{ k}\Omega$ (typical value (see Note 1))
 Connector type: BNC
 Maximum input frequency range: 8 MHz
 Minimum pulse width: 20 ns or more for both H and L
 Sampling skew between channels:
 Channels in one module: Approx. 1 ns (typical value (see Note 1))
 Channels in adjacent modules: 4 ns (typical value (see Note 1))

■ General Specifications

Safety standards: Complies with CSA C22.2 No. 1010.1 and EN61010-1, conforms to JIS C1010-1

Warm-up time: At least 30 minutes

Maximum allowable input voltage:

Channel input: ± 250 V (DC + AC peak) or 177 Vrms

External clock input: -3 V to 8 V

External trigger input: -3 V to 8V

(Overvoltage category: CAT I and II)

Operating conditions: Same as those of the measuring station

Storage conditions:

Temperature: -20°C to 60°C

Humidity: 20% to 80% RH (no condensation)

Power consumption: 10 VA (typical value (see Note 1) at 100 V/50 Hz)

Weight: Approx. 0.7{1.54} kg{lb}

External dimensions: Approx. 33{1.3}(W) × 243{9.54}(H) × 232{9.13}(D) mm{inch} (projections excluded)

Number of used slots: 1

Standard accessories: User's Manual (1)

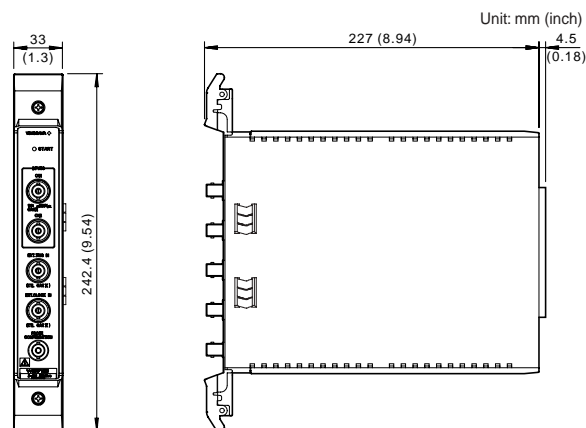
Note 1: Typical value represents a typical or average value. It is not strictly guaranteed.

Note 2: Value measured with offset voltage set to 0 V and time base set to internal clock under ambient temperature: $23 \pm 5^\circ\text{C}$, ambient humidity: $50 \pm 10\%$ RH, after warm-up time has passed and after offset calibration.

Note 3: Value measured with time base set to internal clock under ambient temperature: $23 \pm 5^\circ\text{C}$, ambient humidity: $50 \pm 10\%$ RH, after warm-up time has passed and after offset calibration.

Note 4: Freerun mode and gate mode are not supported.

■ Dimensions



AVAILABLE MODELS

Model	Description
707116	2-CH, 20 MS/s Digitizer Module

Special Accessories(sold separately)

Accessory	Model	Description	Order quantity
400 MHz passive probe	700988	10:1 or 1:1 selectable, 1.5 m	1
Miniclip converter	B9852CR	Probe accessory (one/unit)	1
BNC adapter	B9852CS	Probe accessory (one/unit)	1
Ground lead	B9852CT	Probe accessory (one/unit)	1
50 Ω terminal equipment	700976	Through-type	1

WE7121

10 MHz Function Generator Module

■ Overview

The WE7121 10-MHz function generator module is complete with all of the basic features of a function generator.

The module contains in its flash memory the graphic data for screens used to set such data items as the waveform, output voltage and frequency necessary for module operation. When connected to a personal computer, the module is actuated once it transfers the graphic data to the computer. The module can generate simplified arbitrary waveforms.

■ Features

- 1- μ Hz to 10-MHz oscillation frequency range
- Can generate simple arbitrary waveforms
- Operates in sync with an adjacent WE7121 module

■ Performance Specifications

The following performance specifications are attained under standard operating conditions ("General Specifications").

Waveform output

Number of output channels: 1 channel

Standard output waveforms: Sine wave/square wave (duty cycle fixed at 50%)/triangular wave/ramp wave/pulse wave (duty cycle variable), and inversions of each waveform

Arbitrary waveform

Output amplitude resolution: 12 bit

Memory length: 16384 points (some points are not generated when the repetitive frequency is 2.4 kHz or higher.)

Output operation

Continuous oscillation (CONT): Outputs the waveform continuously

Trigger oscillation (TRIG): Outputs the specified count (integer) of burst waveforms in sync with the trigger.

Gate oscillation (GATE): Outputs the integer count of burst waveforms while the gate is enabled.

DC output (DC): Outputs a DC voltage.

Oscillation frequency range

Sine/Square wave: 1 μ Hz to 10 MHz

Triangular/Pulse wave: 1 μ Hz to 200 kHz

Ramp wave: 1 μ Hz to 200 kHz

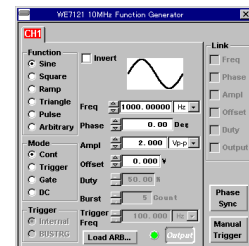
Arbitrary waveform: 1 μ Hz to 200 kHz

Oscillation frequency resolution: 1 μ Hz or 9 digits maximum

Oscillation frequency accuracy: ± 20 ppm

Oscillation frequency stability: ± 20 ppm (when ambient temperature is 5 to 40°C)

Oscillation reference clock: 40.2107 MHz



WE7121

Output characteristics

Maximum output voltage (see Note 1): ± 10 V

Amplitude setting range (see Note 1): 20 Vp-p (resolution: 1 mVp-p)

Amplitude accuracy (see Note 1) (for 1 kHz sine wave): $\pm(0.5\% \text{ of set value} + 14 \text{ mV})$

Oscillation frequency characteristics (see Note 2)

Sine wave

$\leq 100 \text{ kHz} \pm 0.1 \text{ dB}$

$\leq 1 \text{ MHz} \pm 0.2 \text{ dB}$

$\leq 10 \text{ MHz} \pm 0.5 \text{ dB}$

Square/Pulse wave (duty cycle 50%): $\leq 10 \text{ kHz} \pm 2\%$

Triangular wave: $\leq 10 \text{ kHz} \pm 3\%$

Ramp wave: $\leq 10 \text{ kHz} \pm 3\%$

Offset voltage setting range (see Note 1): ± 10 V (resolution: 1 mV)

Offset voltage accuracy (see Note 1): $\pm(0.3\% \text{ of set value} + 0.2\% \text{ of set amplitude} + 20 \text{ mV})$

DC output setting range (see Note 1): ± 10 V (resolution: 1 mV)

DC output accuracy (see Note 1): $\pm(0.3\% \text{ of set value} + 20 \text{ mV})$

Output impedance: $50 \Omega \pm 1\%$, except open when the output is turned OFF

Maximum output current: $\pm 200 \text{ mA}$

Output format: Non-isolated unbalanced

Connector type: BNC

Note 1: Value under high impedance load.

Note 2: Amplitude 20 Vp-p, offset voltage 0 V, 50Ω load, measures RMS value with 1 kHz as a reference.

Sine wave purity

Harmonics (see Note) (Maximum value of the 2nd to 5th order harmonic components)

100 kHz: -55 dBc or less

1 MHz: -45 dBc or less

10 MHz: -35 dBc or less

Harmonic distortion (see Note) (RMS value of 2nd to 5th order harmonic components)

100 kHz: 0.3% or less

Spurious response (see Note) (frequency range 1 kHz to 100 MHz)

100 kHz: -55 dBc or less

Note: Measured with 20 Vp-p amplitude, 0 V offset voltage, 50 Ω load.

Characteristics of sine, pulse, triangular waves

Rise time (see Note)

Square wave: 30 ns or less (10% - 90%)

Pulse wave: 100 ns or less (10% - 90%)

Overshoot (see Note): $\pm 5\%$ or less of the output p-p value

Duty cycle setting (pulse wave only)

Setting range: 0 to 100% (resolution: 0.01% or 25 ns)

Time accuracy (≤ 10 kHz): $\pm 0.2\%$ of (1/set frequency)

Jitter: 1 clock cycle

Note: Measured with 20 Vp-p amplitude, 0 V offset voltage, 50 Ω load.

Phase

Target: Start/stop phase when using trigger/gate oscillation

Setting range: -10000 deg to +10000 deg (resolution: 0.01 deg)

Trigger/Gate

Trigger source: Internal trigger, Bus trigger (BUSTRG1/BUSTRG2) signal on WE bus

Setting range of internal trigger frequency: 1 mHz to 50 kHz (resolution: 1 mHz)

Bus trigger (BUSTRG1/BUSTRG2) signal output source: Able to output waveform synchronization output (SYNC) signal

Setting range of burst count: 1 to 65535 counts (step: 1)

Gate source: Bus trigger (BUSTRG1/BUSTRG2) signal on the WE bus

Synchronous operation

Skew between modules (when modules are linked and outputting the pulse wave): 70 ns per module (Typical value (see Note 1))

Isolation between channels (see Note 2) (when modules are linked): -65 dB (Typical value (see Note 1))

Note 1: Typical value represents a typical or average value. It is not strictly guaranteed.

Note 2: Output waveform: Cross talk for a 10 MHz sine wave with 20 Vp-p amplitude, 0 V offset voltage, 50 Ω load.

Specifications of the Auxiliary Output**Waveform synchronization signal output (SYNC OUT)**

Output level: TTL level, under high impedance load

Output impedance: Approx. 50 Ω

Maximum output current: ± 3.2 mA

Output format: Non-isolated unbalanced

Connector type: BNC

General Specifications

Standard operating conditions

Ambient temperature: 23 $\pm 2^\circ\text{C}$, Ambient humidity: 50 $\pm 10\%$ RH, Error on supply voltage/frequency: within 1% of rating, after the warm-up time has passed

Warm-up time: At least 30 minutes

Operating conditions: Same as that of the measuring station

Storage conditions

Temperature: -20°C to 60°C

Humidity: 20% to 80% RH (no condensation)

Power consumption: 7 VA (Typical value at 100 V/50 Hz (see Note))

External dimensions: Approx. 33{1.3} (W) \times 243{9.54} (H) \times 232{9.12} (D) mm{inch} (projections excluded)

Weight: Approx. 0.7{1.54} kg{lb}

Number of dedicated slots: 1

Standard accessory: User's Manual (1)

Optional accessory

366924 BNC cable (1 m)

366925 BNC cable (2 m)

366926 BNC alligator clip cable (1 m)

366921 Adapter (BNC plug-banana terminal jack)

366927 Adapter (BNC plug-RCA jack)

366928 Adapter (BNC jack-RCA plug)

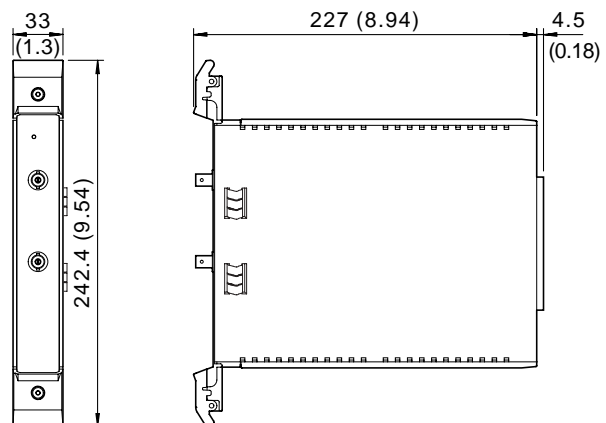
Note: Typical value represents a typical or average value. It is not strictly guaranteed.

AVAILABLE MODEL

Model	Description
707121/HE	10 MHz Function Generator Module

Dimensions

Unit: mm (inch)



WE7141

100 MHz Universal Counter Module

Overview

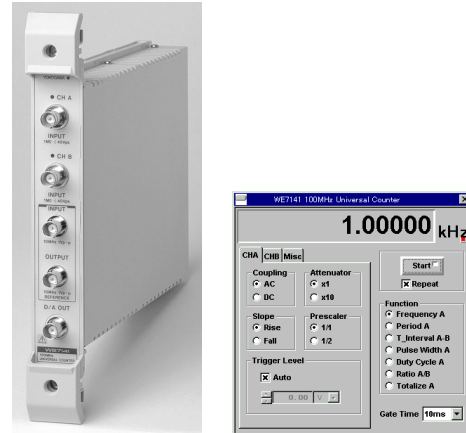
The WE7141 is a universal counter module with a limited range of basic functions. Its flash memory contains setup information required for module operations, such as ranges and gate times. The setup information is transferred to the PC when the module is connected.

Features

- Measurement of frequencies from 1 Hz to 120 MHz
- Wide variety of measurement functions (time interval, pulse width, duty factor, totalization, etc.)
- D/A output function
- Auto-trigger function

Input Section Specifications

- Number of input channels: 2 (A, B)
- Input format: Non-isolated unbalanced
- Connector type: BNC
- Input impedance: 1 M Ω , 40 pF (Typical value (see Note 1))
- Input coupling: DC, AC
- Low frequency: -3 dB point during AC coupling: 35 Hz (Typical value (see Note 1))
- Attenuator: $\times 1$, $\times 10$
- Trigger level
 - When the attenuator is set to $\times 1$: -5 V to +5 V (resolution: 20 mV)
 - When the attenuator is set to $\times 10$: -40 V to +40 V (resolution: 200 mV)
- Setting accuracy (see Note 2): $\pm 10\%$ ± 30 mV of the set value (When the attenuator is set to $\times 1$)
- Trigger slope: Rise, Fall
- Auto trigger: Automatically set to the center value of the input amplitude
- Operation frequency range: Sine wave 50 Hz to 120 MHz (sensitivity: 250 mVrms)
- Operation voltage range: ± 5 V (When the attenuator is set to $\times 1$)
- Input sensitivity (see Note 2)
 - 50 mVrms: DC < input frequency \leq 60 MHz
 - 100 mVrms: 60 MHz < input frequency \leq 120 MHz
- Maximum input voltage
 - 40 V (DC + ACpeak): DC \leq input frequency < 4 MHz
 - ($\frac{140}{f} + 5$) [V (DC + ACpeak)]
 - f [MHz]
 - 4 MHz \leq input frequency < 120 MHz (Overvoltage Category: CAT I and II)
- Channel B gate
 - Gate signal used during frequency A and totalize count measurements
 - Input range: Gate setting pulse width is 100 ns to 100 s (The number of input cycles of channel A within the gate time does not exceed 2^{32} counts.)



WE7141

Gate time of channel B > One period of the input signal of channel A

- Minimum input pulse width (see Note 2): 10 ns (except when using 1/2 prescaler)

Note 1: Typical value represents a typical or average value. It is not strictly guaranteed.

Note 2: Value or allowed value obtained during standard operating conditions.

Specifications for Individual Measurement Functions

Frequency A

- Measurement range: 1 Hz to 120 MHz (when using 1/2 prescaler), 1 mHz to 60 MHz
- Gate time (see Note 1)
 - When using prescaler: 10 ms, 100 ms, 1 s, 10 s
 - When not using prescaler: 10 ms, 100 ms, 1 s, 10 s, CH B gate (channel B pulse width)
- Resolution:

$$\frac{\pm 10 \text{ ns} \pm \sqrt{2} \times \text{Trigger error (see Note 3)}}{\text{Gate time}} \times \frac{\text{Measurement}}{\text{Frequency (Hz)}}$$
- Accuracy (see Note 2): Resolution \pm (Time base aging \times measurement frequency) [Hz]

Period A

- Measurement range: 20 ns to 999.999999 s
- Multiplier: 1, 10, 100, 1000
- Resolution

$$\frac{\pm 10 \text{ ns} \pm \sqrt{2} \times \text{Trigger error (see Note 3)}}{\sqrt{10^N}} \text{ (s)}$$

(10^N denotes the multiplier (N = 0, 1, 2, 3).)
- Accuracy (see Note 2): Resolution \pm (time-base aging \times measurement period) (seconds)

Time Interval A \rightarrow B

- Measurement range: 60 ns to 999.999999 s
- Input frequency range: 1 mHz to 50 MHz (for input channels A and B)

- Multiplier: 1, 10, 100, 1000
- Measurement suspension time: 200 ns (when multiplier = 10, 100, 1000)
- Resolution:

$$\frac{\pm 10 \text{ ns} \pm \text{Channel A input trigger error} \pm \text{Channel B input trigger error}}{\sqrt{10^N}} \quad (\text{s})$$

(10^N denotes the multiplier ($N = 0, 1, 2, 3$)).

- Accuracy (see Note 2): Resolution \pm (Time base aging \times measurement time) \pm trigger level timing error (see Note 4) ± 10 ns error between channels (see Note 5)

Pulse Width A

- Measurement range: 20 ns to 999.999999 s
- Multiplier: 1, 10, 100, 1000
- Resolution:

$$\frac{\pm 10 \text{ ns} \pm \text{Rising edge trigger error} \pm \text{Falling edge trigger error}}{\sqrt{10^N}} \quad (\text{s})$$

(10^N denotes the multiplier ($N = 0, 1, 2, 3$)).

- Accuracy (see Note 2): Resolution \pm (Time base aging \times measurement time) \pm trigger level timing error (see Note 4)

Duty Cycle A

- Measurement range: 0.00000001 to 0.99999999
- Input range: 20 ns to 999.999999 s
- Multiplier: 1, 10, 100, 1000
- Displayed units: Value is displayed as a ratio (50% is displayed as 0.5)
- Resolution:

$$\pm \left(\frac{\text{Pulse width} + |\text{Pulse width resolution}|}{\text{Period} - |\text{Period resolution}|} - \text{measured duty value} \right)$$

- Accuracy (see Note 2):

$$\pm \left(\frac{\text{Pulse width} + |\text{Pulse width accuracy}|}{\text{Period} - |\text{Period accuracy}|} - \text{measured duty value} \right)$$

Frequency Ratio A/B

- Measurement range: 0.001 to 999999999 (When multiplier =1, 0 is displayed when frequency A < B)
- Input range: 1 mHz to 60 MHz
- Multiplier: 1, 10, 100, 1000
- Resolution:

$$\frac{\pm \text{Channel A input 1 count} \pm \sqrt{2} \times \text{Channel B input trigger error}}{10^N} \quad (\text{see Note 3})$$

(10^N denotes the multiplier ($N = 0, 1, 2, 3$)).

- Accuracy (see Note 2): Same as the resolution

Totalized Count A

- Input frequency range: 1 mHz to 50 MHz
- Counting capacity: 0 to 2^{52} (except 0 to 10^9 on the WE7000 Control Software)
- Counting error: ± 1 count during channel B gate measurement
- Counting control: Manual start or channel B gate (pulse width)

Note 1: When one period of the input frequency is greater than or equal to the set gate time, the gate time is the time over one period of the input signal.

Note 2: Value obtained under standard operating conditions. Values outside the measurement range are not guaranteed.

$$\text{Note 3: Trigger error} = \frac{\sqrt{X^2 + En^2}}{S.R.} \quad [\text{S}]$$

X: Counter input section noise = 600[μ Vrms], En: Signal noise [Vrms] within the input amp bandwidth

(120 MHz), SR: Slew rate of the input signal at the trigger level [V/s]

Note 4: Trigger level timing error

$$= \left(\frac{20 \text{ mV}}{S.R. (START)} - \frac{20 \text{ mV}}{S.R. (STOP)} \right)$$

$$\pm \left(\frac{\text{Trigger level setting accuracy}}{S.R. (START)} \pm \frac{\text{Trigger level setting accuracy}}{S.R. (STOP)} \right) [\text{S}]$$

SR(START): Slew rate of the input signal of channel A at the trigger level [V/s](Time interval measurement)

Slew rate of the rising/falling slopes [V/s](pulse width measurement)

SR(STOP): Slew rate of the input signal of channel B at the trigger level [V/s](Time interval measurement)

Slew rate of the rising/falling slopes [V/s](pulse width measurement)

Note 5: 10 ns error between channels: Error due to the difference in the internal delay of channels A and B.

■ External Input/Output Specifications

D/A Output

- Output voltage range: 0 to +10 V (under high impedance load)

Linear conversion, full scale 15 bit D/A

- Range setting range: Set the maximum and minimum values of the range to perform D/A conversion

Setting range: 0 to 2^{52} (except 0 to 10^9 on the WE7000 Control Software)

- Maximum output current: ± 2 mA
- Output format: Non-isolated unbalanced
- Connector type: BNC

Reference Time Specifications

- Internal reference frequency: 10 MHz

- Frequency stability (see Note 1)

Aging rate: $\pm 1.5 \times 10^{-6}$ /yr

Temperature characteristics: $\pm 3 \times 10^{-6}$ (5°C to 40°C)

- Reference output

Connector type: BNC

Output coupling: AC

Output impedance: 50 Ω (Typical value (see Note 2))

Output frequency: 10 MHz (Typical value (see Note 2))

Output level: 1 Vp-p or more (under 50 Ω load)

- External reference input (see Note 1)

Connector type: BNC

Input coupling: AC

Input impedance: 1 k Ω or more

Input frequency range: 10 MHz \pm 10 Hz

Input level: 1 Vp-p or more

Maximum input voltage: ± 10 V (Overvoltage Category: CAT I and II)

Note 1: Value or allowed value obtained during standard operating conditions.

Note 2: Typical value represents a typical or average value. It is not strictly guaranteed.

■ General Specifications

- Standard operating conditions

Temperature: $23 \pm 2^\circ\text{C}$, humidity: $50 \pm 10\%$ RH,

Power voltage/frequency error: within 1% of rating, after the warmup time has passed

- Warmup time: At least 30 minutes

- Operating conditions: Same as those of the measuring station

- Storage conditions
Temperature: -20 to 60°C
Humidity: 20 to 80% RH
- Power consumption: 6 VA (Typical value at 100 V/50 Hz (see Note))
- External dimensions: Approx. 33{1.30} (W) × 243{9.57} (H) × 232{9.13} (D) mm{inch} (projections excluded)
- Weight: Approx. 0.7 {1.54} kg{lb}
- Number of used slots: 1
- Standard accessory: User's Manual (1)
- Optional accessories
 - 700976 50 Ω terminator
 - 366921 Adapter (BNC plug - banana terminal jack)
 - 366923 Connection adapter (T-shaped BNC)
 - 366924 BNC cable (1 m (3.28 ft))
 - 366925 BNC cable (2 m (6.56 ft))
 - 366926 BNC alligator clip cable (1 m (3.28 ft))

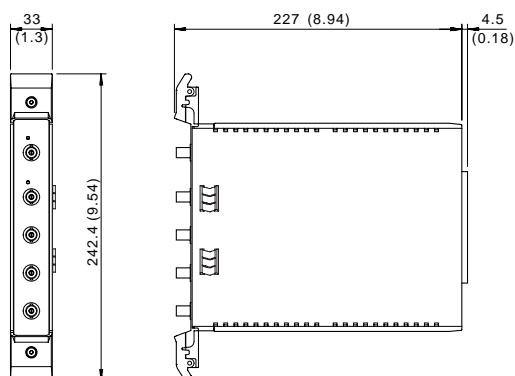
Note: Typical value represents a typical or average value. It is not strictly guaranteed.

AVAILABLE MODEL

Model	Description
707141/HE	100 MHz Universal Counter Module

■ Dimensions

Unit: mm (inch)



WE7235

4-CH 100 kS/s Accelerometer Module

Overview

The WE7235 4-CH 100kS/s Accelerometer module can measure the acceleration in combination with sensors.

This module can be directly connected to low impedance type (built-in amplifier type) accelerometer.

This module also can be connected to high impedance type accelerometer by using a charge converter.

Equipped with four A/D converters, each module can sample data through four channels simultaneously at 100 kHz.

Besides, this module can measure DC voltage.

Features

- 100-kS/s sampling and 16-bit A/D conversion on all four channels simultaneously
- Acceleration measurement
 - Gain: $\times 1$ to $\times 100$ (1-2-5 steps)
 - Drive current supply: 4mA DC
- DC voltage measurement
 - Range: $\pm 50\text{mV}$ to $\pm 50\text{V}$ (1-2.5-5 steps)
- Built-in 4MWords acquisition memory
- Operates in sync with an adjacent WE7235 module

Performance Specifications

Number of Input Channels: 4

Input Format: Non-isolated unbalanced input

Connector Type: BNC

Measurement Mode: Acceleration measurement and voltage measurement

Input Coupling

When measuring acceleration: AC only

When measuring voltage: DC and AC

A/D Resolution: Equivalent to 16 bits (including the sign)

Input Impedance: Approx. 1 M Ω

Allowable Signal Resistance: 100 Ω or less

Frequency Characteristics (When Filter is OFF)

During DC coupling: DC to 40 kHz (-1.5 dB typical value (see Note 1))

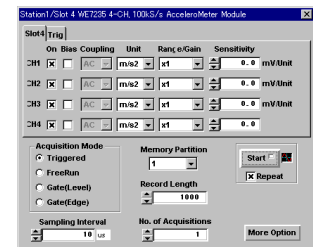
During AC coupling: 0.1 Hz to 40 kHz (-1.5 dB typical value (see Note 1))

Input Filter

Low-pass Filter

Characteristics: 4th order Butterworth (-24 dB/oct)

Cut-off frequency: 40 Hz/100 Hz/400 Hz/1 kHz/4 kHz/10 kHz/40 kHz (3 dB, typical value(See Note 1))



WE7235

Anti-Aliasing Filter

Characteristics: 8th order Cauer

Cut-off frequency: 20 Hz/40 Hz/80 Hz/200 Hz/400 Hz/800 Hz/2 kHz/4 kHz/8 kHz/20 kHz/40 kHz

Pass-band characteristics: 20 Hz to 20 kHz

± 1 dB at 5 to 100% of the cut-off frequency (typical value (see Note 1))

40 kHz

± 1 dB at 5 to 50% of the cut-off frequency, -3 dB at 40 kHz (typical value (see Note 1))

Damping characteristics: 20 Hz

-50 dB at 2.1 times the cut-off frequency (typical value (see Note 1))

40 Hz to 40 kHz

-80 dB at 2.1 times the cut-off frequency (typical value (see Note 1))

Acceleration Measurement

Applicable acceleration sensor: Built-in amplifier type

Sensor supply current: OFF or 4 mA $\pm 10\%$

Sensor supply voltage: OFF or approx. 21 VDC

Sensitivity setting: Enter the acceleration sensor sensitivity on the operation screen (or using the WE Control API (sold separately, model: 707741))

Measurement range: Measurement range automatically set according to the specified acceleration sensor sensitivity.

Amplifier gain and accuracy (when filter is OFF with 1-kHz input under standard operation condition):

Gain	Accuracy (See Note 2)	Temperature Coefficient (at 5 to 18°C and 28 to 40°C)(See Note 2)
×1	±(0.5% of Full Scale)	±(0.01% of Full Scale)/°C
×2	±(0.5% of Full Scale)	±(0.01% of Full Scale)/°C
×5	±(0.5% of Full Scale)	±(0.01% of Full Scale)/°C
×10	±(0.5% of Full Scale)	±(0.02% of Full Scale)/°C
×20	±(0.5% of Full Scale)	±(0.02% of Full Scale)/°C
×50	±(0.5% of Full Scale)	±(0.03% of Full Scale)/°C
×100	±(0.5% of Full Scale)	±(0.05% of Full Scale)/°C

Voltage Measurement: Voltage range and DC accuracy (under standard operating condition):

Measurement Range	DC Accuracy	Temperature Coefficient (at 5 to 18°C and 28 to 40°C)
±50 mV	±(0.15% of rdg +0.5 mV)	±(90ppm + 20μ V)/°C
±100 mV	±(0.15% of rdg +0.5 mV)	±(90ppm + 25μ V)/°C
±250 mV	±(0.15% of rdg +0.5 mV)	±(90ppm + 40μ V)/°C
±500 mV	±(0.05% of rdg +0.5 mV)	±(80ppm + 40μ V)/°C
±1 V	±(0.05% of rdg +0.7 mV)	±(80ppm + 50μ V)/°C
±2.5 V	±(0.05% of rdg +1.8 mV)	±(80ppm + 100μ V)/°C
±5 V	±(0.05% of rdg +3.5 mV)	±(80ppm + 200μ V)/°C
±10 V	±(0.05% of rdg +7 mV)	±(95ppm + 500μ V)/°C
±25 V	±(0.05% of rdg +18 mV)	±(95ppm + 1mV)/°C
±50 V	±(0.05% of rdg +35 mV)	±(95ppm + 2mV)/°C

Measurement range and AC accuracy (when filter is OFF with 1-kHz input under standard operation condition):

Measurement Range	AC Accuracy (See Note 2)	Temperature Coefficient (at 5 to 18°C and 28 to 40°C)(See Note 2)
±50 mV	±(0.5% of Full Scale)	±(0.05% of Full Scale)/°C
±100 mV	±(0.5% of Full Scale)	±(0.03% of Full Scale)/°C
±250 mV	±(0.5% of Full Scale)	±(0.02% of Full Scale)/°C
±500 mV	±(0.5% of Full Scale)	±(0.02% of Full Scale)/°C
±1 V	±(0.5% of Full Scale)	±(0.01% of Full Scale)/°C
±2.5 V	±(0.5% of Full Scale)	±(0.01% of Full Scale)/°C
±5 V	±(0.5% of Full Scale)	±(0.01% of Full Scale)/°C
±10 V	±(0.5% of Full Scale)	±(0.01% of Full Scale)/°C
±25 V	±(0.5% of Full Scale)	±(0.01% of Full Scale)/°C
±50 V	±(0.5% of Full Scale)	±(0.01% of Full Scale)/°C

Acquisition Mode: Trigger, free run, gate (level), gate (edge)

Memory Length of Acquisition Memory: 4 Mwords

Memory Partition (partition possible only when trigger mode is selected): Select from 1/2/4/8/16/32/64/128/256 partitions

Maximum Record Length: 1 MWord/CH (when using 3CH/4CH), 2 MWords/CH (when using 2CH), and 4 MWords/CH (when using 1CH)

Time Base Source: Module's internal clock or the time base signal (CMNCLK) of the measuring station (WE bus)

Maximum Sampling Rate: 100 kS/s

Internal Time Base: 10 μ s to 10 s (1-μ s steps)

Time Base Accuracy

When module's internal clock is selected: Same as the reference clock accuracy of the measuring station (±100 ppm for 707001/707002)

Trigger Source: Input signal (including input signals from other digitizer modules that are linked) or the bus trigger signal (BUSTRG1/BUSTRG2) of the measuring station

Bus Trigger (BUSTRG1/BUSTRG2) Signal Output

Source: The trigger detected from the input signal can be output

Trigger Level

Resolution

When measuring acceleration

1% of the full-scale value (selectable range: +100% to -100%)

When measuring voltage

Measurement Range	Resolution
±50 mV	0.1 mV
±100 mV	1 mV
±250 mV	1 mV
±500 mV	1 mV
±1 V	10 mV
±2.5 V	10 mV
±5 V	10 mV
±10 V	100 mV
±25 V	100 mV
±50 V	100 mV

Hysteresis width: 3% of (upper limit of range – lower limit of range) (typical value (see Note 1))

Setting accuracy: 3% of (upper limit of range – lower limit of range) (typical value (see Note 1))

Trigger Type: Edge trigger, state trigger, and combination trigger (AND/OR of the input signal)

Amount of Pretrigger: Set in the range from 0 to (the record length – 2)

Sensor Connection Test Function: Checks the opened or shortened condition of the sensor (only when acceleration sensors are connected)

Note 1: Typical value represents a typical or average value. It is not strictly guaranteed.

Note 2: The full scale value is the measurement range between 0 and the positive full scale value.

■ General Specifications

Safety Standards: Complies with CSA C22.2 No.1010.1
and EN61010-1, conforms to JIS C1010-1

Warm-up Time: At least 30 minutes

Maximum Allowable Input Voltage: ± 60 V (DC + AC
peak)

Operating Conditions: Same as those of the measuring
station

Storage Conditions

Temperature: -20°C to 60°C

Humidity: 20% to 80% RH (no condensation)

Power Consumption: 12 VA (typical value at 100 V/50 Hz
(see Note 3))

Weight: Approx. 0.8{1.76} kg {lb}

External Dimensions: Approx. 33{1.3}(W) \times
243{9.54}(H) \times 232{9.13}(D) mm {inch}
(projections excluded)

Number of Used Slots: 1

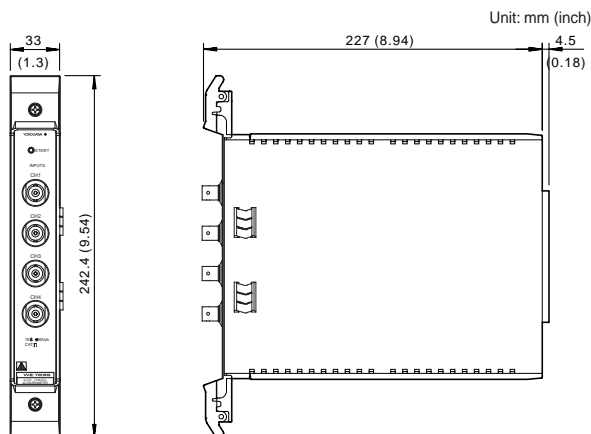
Standard Accessories: User's Manual (this manual) (1)

Note 3: Typical value represents a typical or average value. It
is not strictly guaranteed.

AVAILABLE MODEL

Model	Description
707235/HE	4-CH, 100 kS/s Accelerometer Module

■ Dimensions



WE7241

10-CH Digital Thermometer Module

Overview

The WE7241 multiplexes 10 channels of thermocouple or voltage inputs, enabling measurements with periods as short as 0.5 second. Its internal flash memory contains setup information required for module operations, such as ranges and measurement periods. Setup information set on this screen is transferred to the PC when the module is connected.

Features

- Thermocouple measurement with reference junction compensating circuit
- 10-channel multiplexed input
- Isolation between channels

Functions

- Synchronized operations between adjacent WE7241 modules
- 50/60 Hz noise is removed by a digital filter.

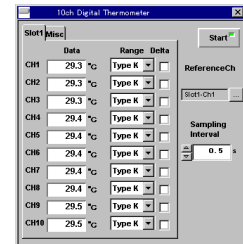
Performance Specifications

- Number of input channels: 10
- Input format: Floating unbalanced input(multiplexer format), isolation between channels and between the input and ground
- Measurement range/accuracy (ambient temperature 23 \pm 5 $^{\circ}$ C, ambient humidity 50 \pm 10% RH, after the warmup time has passed)

DC Voltage Input Range	Setting Accuracy	Resolution
50 mV	$\pm(0.07\% \text{ of rdg} + 40 \mu\text{V})$	10 μV
100 mV	$\pm(0.06\% \text{ of rdg} + 60 \mu\text{V})$	10 μV
200 mV	$\pm(0.06\% \text{ of rdg} + 80 \mu\text{V})$	10 μV
500 mV	$\pm(0.06\% \text{ of rdg} + 200 \mu\text{V})$	100 μV
1 V	$\pm(0.06\% \text{ of rdg} + 400 \mu\text{V})$	100 μV
2 V	$\pm(0.06\% \text{ of rdg} + 600 \mu\text{V})$	100 μV
5 V	$\pm(0.2\% \text{ of rdg} + 2 \text{ mV})$	1 mV
10 V	$\pm(0.2\% \text{ of rdg} + 3 \text{ mV})$	1 mV
20 V	$\pm(0.2\% \text{ of rdg} + 5 \text{ mV})$	1 mV
50 V	$\pm(0.2\% \text{ of rdg} + 20 \text{ mV})$	10 mV

- Temperature coefficient(at 5 to 18 $^{\circ}$ C or 28 to 40 $^{\circ}$ C): $\pm 70 \text{ ppm}/^{\circ}\text{C}$ of rdg at 50 mV to 2 V range, $\pm 80 \text{ ppm}$ of rdg/ $^{\circ}\text{C}$ at 5 V to 50 V range

Thermocouple Input		
Type	Accuracy Guaranteed Measurement Range	Resolution
K	–200.0 to 1300.0 $^{\circ}$ C $\pm(0.1\% \text{ of rdg} + 1^{\circ}\text{C})$, except –200 $^{\circ}$ C to 0 $^{\circ}$ C: $\pm(0.6\% \text{ of rdg} + 1^{\circ}\text{C})$	0.1 $^{\circ}$ C
E	–200.0 to 800.0 $^{\circ}$ C $\pm(0.05\% \text{ of rdg} + 1^{\circ}\text{C})$, except –200 $^{\circ}$ C to 0 $^{\circ}$ C: $\pm(0.3\% \text{ of rdg} + 1^{\circ}\text{C})$	0.1 $^{\circ}$ C
J	–200.0 to 1100.0 $^{\circ}$ C $\pm(0.1\% \text{ of rdg} + 1^{\circ}\text{C})$, except –200 $^{\circ}$ C to 0 $^{\circ}$ C: $\pm(0.4\% \text{ of rdg} + 1^{\circ}\text{C})$	0.1 $^{\circ}$ C
T	–200.0 to 400.0 $^{\circ}$ C $\pm(0.01\% \text{ of rdg} + 1^{\circ}\text{C})$, except –200 $^{\circ}$ C to 0 $^{\circ}$ C: $\pm(0.4\% \text{ of rdg} + 1^{\circ}\text{C})$	0.1 $^{\circ}$ C



WE7241

L	–200.0 to 900.0 $^{\circ}$ C	$\pm(0.1\% \text{ of rdg} + 1^{\circ}\text{C})$, except –200 $^{\circ}$ C to 0 $^{\circ}$ C: $\pm(0.3\% \text{ of rdg} + 1^{\circ}\text{C})$	0.1 $^{\circ}$ C
U	–200.0 to 400.0 $^{\circ}$ C	$\pm(0.1\% \text{ of rdg} + 1.5^{\circ}\text{C})$, except –200 $^{\circ}$ C to 0 $^{\circ}$ C: $\pm(0.5\% \text{ of rdg} + 1.5^{\circ}\text{C})$	0.1 $^{\circ}$ C
N	–200.0 to 1300.0 $^{\circ}$ C	$\pm(0.05\% \text{ of rdg} + 1.5^{\circ}\text{C})$, except –200 $^{\circ}$ C to 0 $^{\circ}$ C: $\pm(1\% \text{ of rdg} + 1.5^{\circ}\text{C})$	0.1 $^{\circ}$ C
R	–50.0 to 1700.0 $^{\circ}$ C	$\pm(0.1\% \text{ of rdg} + 3^{\circ}\text{C})$, except –50 $^{\circ}$ C to 200 $^{\circ}$ C: $\pm 8^{\circ}\text{C}$, 200 $^{\circ}$ C to 800 $^{\circ}$ C: $\pm 4^{\circ}\text{C}$	0.1 $^{\circ}$ C
S	–50.0 to 1700.0 $^{\circ}$ C	$\pm(0.1\% \text{ of rdg} + 3^{\circ}\text{C})$, except –50 $^{\circ}$ C to 200 $^{\circ}$ C: $\pm 8^{\circ}\text{C}$, 200 $^{\circ}$ C to 800 $^{\circ}$ C: $\pm 4^{\circ}\text{C}$	0.1 $^{\circ}$ C
B	400.0 to 1800.0 $^{\circ}$ C	$\pm(0.1\% \text{ of rdg} + 4^{\circ}\text{C})$, except 400 $^{\circ}$ C to 700 $^{\circ}$ C: $\pm 7^{\circ}\text{C}$	0.1 $^{\circ}$ C
W	0.0 to 2300.0 $^{\circ}$ C	$\pm(0.2\% \text{ of rdg} + 3^{\circ}\text{C})$, except 400 $^{\circ}$ C to 700 $^{\circ}$ C: $\pm 7^{\circ}\text{C}$	0.1 $^{\circ}$ C
KPvsAu7Fe	0 to 23K: $\pm(2.5\text{K})$, 0.0 to 278.0K	23K to 278K: $\pm(0.5\text{K})$	0.1K

- Temperature coefficient (at 5 to 18 $^{\circ}$ C or 28 to 40 $^{\circ}$ C): $\pm(200 \text{ ppm of rdg})/^{\circ}\text{C}$
- K, E, J, T, N, R, S, B: JIS C1602-1995
- L, U: DIN 43710
- W: ASTM 988-84
- KPvsAu7Fe: ASTM SPT430
- Reference Junction Compensation Accuracy (using 707821, when the temperature of the input terminal is balanced, excluding noise components)
 - When measuring above 0 $^{\circ}$ C: $\pm 1^{\circ}\text{C}$, when measuring below 0 $^{\circ}$ C: $\pm 1.5^{\circ}\text{C}$
 - No guarantees on accuracy during KPvsAu7Fe measurement
 - For Type-W when measuring up to 200 $^{\circ}$ C: $\pm 1^{\circ}\text{C}$, when measuring above 200 $^{\circ}$ C $\pm 1.5^{\circ}\text{C}$
 - No reference junction compensation for Type-B
- Input coupling method: DC
- Input resistance: 1 M Ω or more
- Maximum source resistance: 1 k Ω or less
- Normal mode rejection ratio (when the frequency is 50/60 Hz ± 0.1 Hz): 50 dB or more
- Common mode rejection ratio (when the frequency is 50/60 Hz ± 0.1 Hz): 120 dB or more (when using the guard)

- A/D resolution: Equivalent to 14 bits (when applying DC voltage)
- Time base: Module's internal clock, or the time base (CMNCLK) signal of the measuring station
- Sampling interval
 - When using the internal time base: 0.5 s to 60 s
 - When using the time base (CMNCLK) signal of the measuring station: 2.0 s or longer
- Connector type: DIN connector (96-pin, male)

■ General Specifications

- Safety standard: Conforms to CSA C22.2 No. 1010.1 and EN61010-1, conforms to JIS C1004
- Warm-up time: At least 30 minutes
- Operating conditions: Same as those of the measuring station
- Storage conditions
 - Temperature: -20 to 60°C
 - Humidity: 20 to 80% RH (no condensation)
- Maximum allowable input voltage: 30 VACrms, 42.4 Vpeak or ± 60 VDC (Overvoltage Category: CAT I and II)
- Maximum common mode voltage: 150 Vrms or ± 150 VDC between the L terminal and ground
- Maximum noise between channels: 60 VACrms, 84.8 Vpeak or ± 100 VDC
- Insulation withstand voltage
 - Between input terminals: 60 Hz 1000 VACrms for one minute
 - Between input terminal and ground: 60 Hz 1500 VACrms for one minute
- Insulation resistance
 - Between input terminal and ground, between input terminals: 500 VDC, 10 M Ω or more
- Power consumption: 7 VA (typical value (see Note) at 100 V/50 Hz)
- External dimensions: Approx. 33{1.30} (W) \times 243{9.57} (H) \times 232{9.13} (D) mm{inch} (projections excluded)
- Weight: Approx. 0.8{1.76} kg{lb}
- Number of used slots: 1
- Standard accessory: User's Manual (1)
- Optional accessory
 - 707821 Input terminal block

Note: Typical value represents a typical or average value. It is not strictly guaranteed.

AVAILABLE MODEL

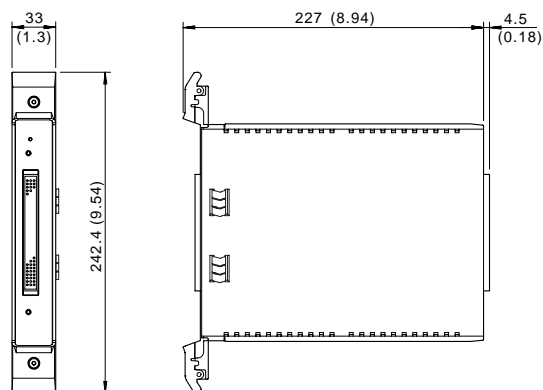
Model	Description
707241/HE	10-CH, Digital Thermometer Module

Special Accessory (sold separately)

Accessory	Model	Specifications	Order quantity
Input terminal block	707821	Temperature and voltage measurement	1

■ Dimensions

Unit: mm (inch)



WE7245

4-CH, 100 kS/s Strain Module

■ Overview

The WE7245 4-channel 100-kS/s Strain module can convert 4 channels' worth of analog signals to digital signals at a maximum speed of 100 kHz. Equipped with four A/D converters and strain amplifier, each module can sample data through four channels simultaneously at 100 kHz.

By being distorted with the bridge of outside attachment and connecting a gauge, strain can be measured.

The input channels are isolated from each other, as well as from the ground

■ Features

- 4CH simultaneous sampling
- Strain measurement (± 1000 micro to ± 20000 micro)
- Voltage measurement (± 100 mV to ± 20 V)
- Highest sampling speed: 100 kS/s
- Isolation between inputs and between inputs and ground.

■ Performance Specifications

Number of Input Channels: 4

Input Format: Isolated differential input (strain measurement), isolated unbalanced input (voltage measurement), isolation between channels and between the input and ground (strain and voltage measurement)

Frequency Bandwidth: DC to 20 kHz

A/D Resolution: 15 bits (includes the sign)

Maximum Sampling Rate: 100 kS/s

Allowable Signal Resistance: 1 k Ω less

Input Filter: Low-pass filter, filter can be turned ON/OFF

Cut-off frequency: 10 Hz, 30 Hz, 100 Hz, 300 Hz, 1 kHz, 3 kHz, 10 kHz, OFF (20 kHz) (Typical value (see Note))

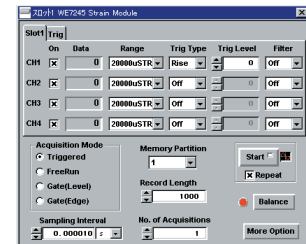
Cut-off characteristics: -18 dB/octave

Input Terminal: D-sub 9-pin connector (female)

Strain Measurement

Measurement range/Accuracy (Ambient temperature: $23 \pm 5^\circ\text{C}$ Ambient humidity: $50 \pm 10\%$ RH, after the warm-up time has passed, filter is 10 Hz, after balancing, measurement range is for when the gauge factor is 2)

Setting	Measurable Range
1000×10^{-6} strain	$\pm 1000 \times 10^{-6}$ strain
2000×10^{-6} strain	$\pm 2000 \times 10^{-6}$ strain
5000×10^{-6} strain	$\pm 5000 \times 10^{-6}$ strain
10000×10^{-6} strain	$\pm 10000 \times 10^{-6}$ strain
20000×10^{-6} strain	$\pm 20000 \times 10^{-6}$ strain
0.5 mV/V	± 0.5 mV/V
1 mV/V	± 1 mV/V
2 mV/V	± 2 mV/V
5 mV/V	± 5 mV/V
10 mV/V	± 10 mV/V



WE7245

The accuracy varies depending on the selected bridge voltage as shown below.

Accuracy	Temperature Coefficient	Notes:
$\pm(0.25\% \text{ of rdg} + 18 \times 10^{-6} \text{ strain})$	$\pm(120 \text{ ppm of rdg} + 2.4 \times 10^{-6} \text{ strain})/^{\circ}\text{C}$	When the bridge voltage is 2 V
$\pm(0.25\% \text{ of rdg} + 36 \times 10^{-6} \text{ strain})$	$\pm(120 \text{ ppm of rdg} + 3.6 \times 10^{-6} \text{ strain})/^{\circ}\text{C}$	When the bridge voltage is 5 V
$\pm(0.25\% \text{ of rdg} + 84 \times 10^{-6} \text{ strain})$	$\pm(120 \text{ ppm of rdg} + 8.4 \times 10^{-6} \text{ strain})/^{\circ}\text{C}$	When the bridge voltage is 10 V

Applicable Gauge Resistance:

120 to 1000 Ω (bridge voltage 2 V)

350 to 1000 Ω (bridge voltage 5 or 10 V)

Gauge Factor: 2

Bridge Voltage: 2, 5, and 10 V (Output current of 35 mA or less, typical value)

Balancing Method

Electronic auto balance

Balance range: ± 10000 μstrain (Typical value (see Note))

Balance mode: All channels at once

Shunt Calibration: Built-in relay contact for shunt calibration

Voltage Measurement

Measurement range/Accuracy (Ambient temperature: $23 \pm 5^\circ\text{C}$, Ambient humidity: $50 \pm 10\%$ RH, after the warm-up time has passed, filter is 10 Hz)

Setting	Measurable Range	Accuracy	Temperature Coefficient
100 mV	± 100 mV	$\pm(0.06\% \text{ of rdg} + 0.4 \text{ mV})$	$\pm(60 \text{ ppm of rdg} + 48 \mu\text{V})/^\circ\text{C}$
200 mV	± 200 mV	$\pm(0.06\% \text{ of rdg} + 0.4 \text{ mV})$	$\pm(60 \text{ ppm of rdg} + 48 \mu\text{V})/^\circ\text{C}$
500 mV	± 500 mV	$\pm(0.06\% \text{ of rdg} + 0.4 \text{ mV})$	$\pm(60 \text{ ppm of rdg} + 48 \mu\text{V})/^\circ\text{C}$
1 V	± 1 V	$\pm(0.06\% \text{ of rdg} + 0.4 \text{ mV})$	$\pm(60 \text{ ppm of rdg} + 48 \mu\text{V})/^\circ\text{C}$
2 V	± 2 V	$\pm(0.06\% \text{ of rdg} + 0.6 \text{ mV})$	$\pm(60 \text{ ppm of rdg} + 48 \mu\text{V})/^\circ\text{C}$
5 V	± 5 V	$\pm(0.06\% \text{ of rdg} + 4 \text{ mV})$	$\pm(60 \text{ ppm of rdg} + 0.36 \text{ mV})/^\circ\text{C}$
10 V	± 10 V	$\pm(0.06\% \text{ of rdg} + 4 \text{ mV})$	$\pm(60 \text{ ppm of rdg} + 0.36 \text{ mV})/^\circ\text{C}$
20 V	± 20 V	$\pm(0.06\% \text{ of rdg} + 6 \text{ mV})$	$\pm(60 \text{ ppm of rdg} + 0.36 \text{ mV})/^\circ\text{C}$

Acquisition Method

Trigger, free run, gate (level), gate (edge)

Memory Length of Acquisition Memory: 4 MWords

Memory Partition (partition possible only when trigger mode is selected): Select from 1/2/4/8/16/32/64/128/256 partitions

Maximum Record Length:

1 MWord/CH (when using 3CH/4CH),
2 MWords/CH (when using 2CH), and
4 MWords/CH (when using 1CH)

Time Base Source

Module's internal clock or the time base signal (CMNCLK) of the measuring station

Trigger Source

Input signal (AND/OR between channels is possible) or the bus trigger (BUSTRG1/BUSTRG2) signal of the measuring station

Trigger Level

Resolution

When measuring the strain:

100 μSTR at $\pm 20000 \mu\text{STR}/\pm 10000 \mu\text{STR}$ range, 10 μSTR at $\pm 5000 \mu\text{STR}/\pm 2000 \mu\text{STR}/\pm 1000 \mu\text{STR}$ range 0.1 mV/V at ± 10 mV range, 0.01 mV/V at ± 5 mV/V/ ± 2.5 mV/V/ ± 1 mV/V range, 0.001 mV/V at ± 0.5 mV range

When measuring the voltage:

1 mV at ± 100 mV/ ± 200 mV/ ± 500 mV range, 10 mV at ± 1 V/ ± 2 V/ ± 5 V range, 100 mV at ± 10 V/ ± 20 V range

Hysteresis width

3% of (upper limit of range - lower limit of range) (Typical value (see Note))

Setting Accuracy

3% of (upper limit of range - lower limit of range) (Typical value (see Note))

Amount of Pretrigger

Set in the range from 0 to (the record length - 2)

Note: Typical value represents a typical or average value. It is not strictly guaranteed.

General Specifications

Safety Standard: Complies with CSA C22.2 No.1010.1 and EN61010-1, conforms to JIS C1010-1

Warm-up Time: At least 30 minutes

Maximum Allowable Input Voltage: ± 30 V (DC + ACpeak)

Maximum Floating Voltage: 30 VACrms, 42.4 Vpeak or 60 VDC (Overvoltage Category: CAT I and II) Between the common terminal of each channel and the case and between input channels for all voltages above

Common Mode Rejection Ratio:

Strain measurement range: 80 dB or greater (converted to voltage when the bridge voltage is 2 V and the gauge factor is 2)

Voltage range: 65 dB or greater

Signal source resistance of 1 k Ω or less between the input terminal and the case at 50/60 Hz

Operating Conditions: Same as those of the measuring station

Storage Conditions

Temperature: -20 to 60°C

Humidity: 20 to 80% RH (no condensation)

Power Consumption: 15 VA (typical value at 100 V/50 Hz)

External Dimensions: Approx. 33{1.30} (W) \times 243{9.57} (H) \times 232{9.13} (D) mm{inch} (projections excluded)

Weight: Approx. 1{2.2} kg{lb}

Number of Used Slots: 1

Standard Accessories: D-Sub 9-pin connector (male) (4), Clamp filter (4), User's Manual (1)

Note: Typical value represents a typical or average value. It is not strictly guaranteed.

AVAILABLE MODELS

Model	Description
707245/HE	4-CH, 100 kS/s Strain Module

Special Accessories (sold separately)

Accessory	Model	Description	Order quantity
Bridge head	700932/WE	120 Ω , 5 m	1
Bridge head	700933/WE	350 Ω , 5 m	1
Bridge head	700967	120 Ω , 5 m, With Shunt Cal	1
Bridge head	700968	150 Ω , 5 m, With Shunt Cal	1

Accessories (sold separately)

Accessory	Model	Description	Order quantity
I/O connector (cover)	A1618JD	D-sub (9 pin)	1
I/O connector (cover)	A1520JD	D-sub (9 pin)	1

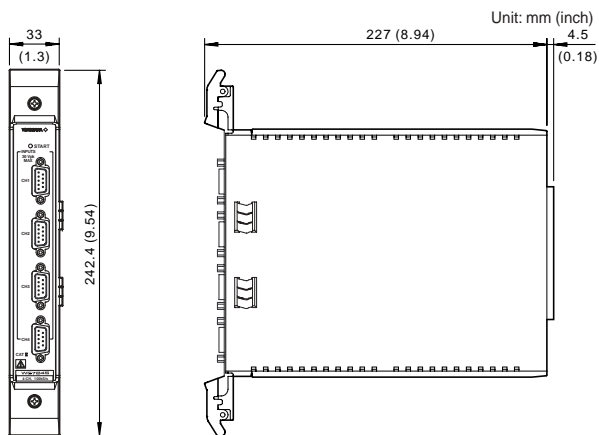


700932/WE
700933/WE



700967
700968

■ Dimensions



WE7251

10-CH, 100 kS/s Digitizer Module

■ Overview

The WE7251 is a digitizing module which scans 10 analog input channels using a multiplexer. It is capable of A/D conversion at a maximum frequency of 100 kHz (when scanning a single channel). Its flash memory contains setup information required for module operations, such as ranges and sampling rates. Setup information is transferred to the PC when the module is connected. The signal connection process is easy with the special terminal block accessory. Multiple WE7251 modules can be installed next to each other to synchronize their operations. The WE7251 also supports a trigger function which allows data preceding and following an event to be collected.

■ Features

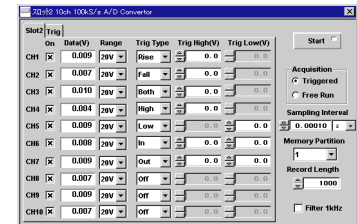
- 10-channel multiplexed input
- 100 kS/s, 16-bit A/D conversion
- Built-in acquisition memory with 1 MWords capacity
- Synchronized operations between adjacent WE7251 modules
- Trigger function which allows data preceding and following an event to be collected

■ Performance Specifications

- Number of input channels: 10
- Input format: Floating unbalanced input(multiplexer format, no isolation between channels), isolation between the input and ground
- Input coupling: DC
- A/D resolution: 16 bits
- Input impedance: Approx. 1 M Ω
- Maximum source resistance: 100 Ω or less
- Input filter: OFF/1 kHz (–3 dB attenuation point)
- Frequency characteristics: DC to 10 kHz (–3 dB attenuation point, during filter OFF) (Typical value (see Note))
- Measurement range/Accuracy (Ambient temperature: 23 \pm 5 $^{\circ}$ C, Ambient humidity: 50 \pm 10% RH, after the warmup time has passed)

Range	Accuracy	Temperature coefficient (at 5-18 $^{\circ}$ C, 28-40 $^{\circ}$ C)
\pm 1 V	\pm (0.05% of rdg + 1 mV)	\pm (50 ppm of rdg + 70 mV)/ $^{\circ}$ C
\pm 2 V	\pm (0.05% of rdg + 1.6 mV)	\pm (50 ppm of rdg + 0.1 mV)/ $^{\circ}$ C
\pm 5 V	\pm (0.05% of rdg + 3.2 mV)	\pm (50 ppm of rdg + 0.18 mV)/ $^{\circ}$ C
\pm 10 V	\pm (0.07% of rdg + 10 mV)	\pm (70 ppm of rdg + 0.7 mV)/ $^{\circ}$ C
\pm 20 V	\pm (0.07% of rdg + 20 mV)	\pm (70 ppm of rdg + 1.0 mV)/ $^{\circ}$ C

- Acquisition method: Trigger, free run, gate
- Memory length of acquisition memory: 1 MWord
- Memory partition (partition possible only when trigger mode is selected): Select from 1/2/4/8/16/32/64/128/256 partitions
- Maximum record length: 1 MWord



WE7251

- Time base source: Module's internal clock, or the time base signal (CMNCLK) of the measuring station
- Minimum sampling interval: Number of measurement channels \times 10 μ s (when the filter is turned OFF)
- Internal time base: When the filter is turned OFF: 10 μ s to 10 s, When the filter is turned ON: 10 ms to 10 s
- Trigger source: Input signal (includes input signals of other digitizer modules that are linked), or the bus trigger (BUSTRG1/BUSTRG2) signal of the measuring station
- Bus trigger signal (BUSTRG1/BUSTRG2) output source: Able to output the trigger detected from the input signal
- Trigger level
Resolution: 10 mV at \pm 1/2/5 V range, 100 mV at \pm 10/20 V range (Typical value (see Note))
Hysteresis width: 0.8% of (upper limit of range – lower limit of range) (Typical value (see Note))
Measurement accuracy: 0.2% of \pm (upper limit of range – lower limit of range)
- Trigger type: Edge trigger, state trigger, window trigger, combination trigger (AND/OR of the input signals)
- Amount of pre-trigger: Set 0 to 100% of the record length
- Connector type: DIN connector (96 pins, male)

Note: Typical value represents a typical or average value. It is not strictly guaranteed.

■ General Specifications

- Safety standard: Conforms to CSA C22.2 No. 1010.1 and EN61010-1, conforms to JIS C1004
- Warm-up time: At least 30 minutes
- Maximum allowable input voltage: 30 VACrms, 42.4 Vpeak or \pm 60 VDC (Overvoltage Category: CAT I and II)
- Maximum common mode voltage: 100 Vrms or \pm 100 VDC between the L terminal and ground
- Insulation withstand voltage
Between input terminal and ground: 60 Hz 1000 VACrms for one minute

- Insulation resistance
Between input terminal and ground: 500 VDC, 10 MΩ or more
- Operating conditions: Same as those of the measuring station
- Storage conditions
Temperature: -20 to 60°C
Humidity: 20 to 80% RH
- Power consumption: 8 VA (typical value (see Note) at 100 V/50 Hz)
- External dimensions: Approx. 33{1.30} (W) × 243{9.57} (H) × 232{9.13} (D) mm{inch} (projections excluded)
- Weight: Approx. 0.7{1.54} kg{lb}
- Number of used slots: 1
- Standard accessory: User's Manual (1)
- Optional accessory
707821 Input terminal block

Note: Typical value represents a typical or average value. It is not strictly guaranteed.

AVAILABLE MODEL

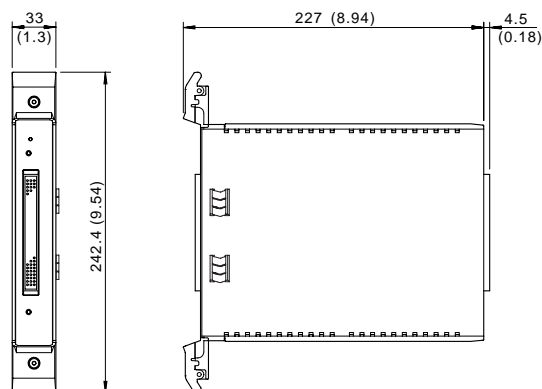
Model	Description
707251/HE	10-CH, 100 kS/s Digitizer Module

Special Accessory (sold separately)

Accessory	Model	Specifications	Order quantity
Input terminal block	707821	Temperature and voltage measurement	1

■ Dimensions

Unit: mm (inch)



WE7262

32-Bit Digital I/O Module

■ Overview

The WE7262 32-bit digital I/O module is used to input or output TTL/CMOS-level digital signals.

The module contains in its flash memory the graphic data for screens used to set such data items as the I/O setpoints necessary for module operation. When connected to a personal computer, the module is actuated once it transfers the graphic data to the computer. In addition, the module is provided with a 2-channel pulse counter. An optional 16-bit I/O terminal box can be connected to the module to enable the module to handle contact I/O signals.

■ Features

- 32-bit non-isolated bi-directional digital I/Os
- Continuous measurement
- 2-channel counter function
- 2MHz maximum input frequency in the counter block
- Detection of input-pattern matches on an 8-bit basis

■ Performance Specifications

Input/Output Section

Number of input/output points: 32 points

Maximum output current: ± 3.2 mA

Output voltage

H level @ -3.2 mA: 3.8 V min

L level @ 3.2 mA: 0.5 V max

Input voltage

H level: 2.0 V min

L level: 0.6 V max

Maximum allowable input voltage: -3 V to $+8$ V (Over-voltage Category: CAT I and II)

Sampling interval during continuous measurement of input pattern: 10 ms to 10 s

Output impedance Approx. 100 Ω

Input impedance: Approx. 47 k Ω

Input format: Non-isolated unbalanced

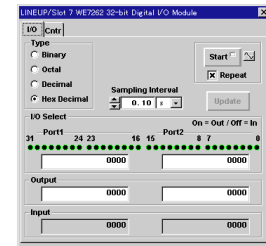
Connector type: D-sub type 25 pins (female)

Pattern match detection (see Note 1)

Detection bit: Compares every 8 bits of input, generates up to 4 interrupts

Chattering elimination: ON/OFF selectable. When turned ON, eliminates bouncing of frequencies less than or equal to 1 ms

When three or more WE7262 modules are put into operation for continuous measurement, the sampling interval of each module must be set to no shorter than 20 ms.



WE7262

Counter Section

Number of input channels: 2

External input frequency: 2 MHz max

Minimum input pulse width: 100 ns

Input voltage

H level: 2.0 V min

L level: 0.4 V max

Maximum allowable input voltage: -3 V to $+8$ V (Over-voltage category: CAT I and II)

Input impedance: Approx. 47 k Ω

Input format: Non-isolated unbalanced

Maximum number of counts: FFFE0000H (4294836224)

Overflow detection

Counter overflow detectable

Control (Count enable)

- Manual gate
- Internal gate: Control with the timer
 - Selectable range: 1 ms to 600 s
 - Resolution: 0.1 ms
 - Setting accuracy (see Note 2): $\pm(0.02\%$ of setting + 1 μ s)
- External gate: Control with external signal, H active, common to both input channels
 - Number of inputs: 1
 - Input pulse width: 1 ms or more

Note 1: Not supported by the WE7000 Control Software.

Note 2: Measurement value obtained under standard operating conditions.

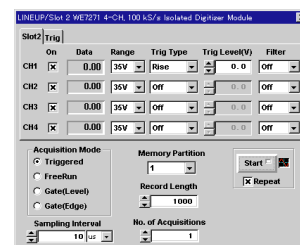
WE7271/WE7272

4-CH, 100 kS/s Isolated Digitizer Module

■ Overview

The WE7271/WE7272 4-channel 100-kS/s isolated digitizer module can convert 4 channels' worth of analog signals to digital signals at a maximum speed of 100 kHz. Equipped with four A/D converters, each module can sample data through four channels simultaneously at 100 kHz. The input channels are isolated from each other, as well as from the ground.

Each module contains in its flash memory the graphic data for screens used to set such data items as the range and sampling rate necessary for module operation. When connected to a personal computer, the module is actuated once it transfers the graphic data to the computer. In addition, two or more modules can be mounted side by side to enable synchronous operation. These modules support the trigger function that permits you to acquire data before and after the rise of a specific event.



WE7271/WE7272

■ Features

- 100-kS/s sampling and 16-bit analog-to-digital conversion on all four channels simultaneously
- Isolation between inputs and between inputs and ground
- Built-in 4MWord acquisition memory
- Operates in sync with an adjacent WE7271/WE7272 module
- Trigger function that allows data immediately before and after the rise of an event, to be acquired correctly
- Input connector
WE7271: Clamp type terminal
WE7272: BNC

■ Performance Specifications

Number of input channels: 4
 Input format: Floating unbalanced input, isolation between channels and between the input and ground
 A/D resolution: 16 bits
 Input impedance: Approx. 1 M Ω
 Input coupling: DC
 Maximum source resistance: 100 Ω or below
 Input filter: OFF/5 kHz/500 Hz (typical value (see Note 1) at -3 dB attenuation point)
 Frequency characteristics: DC to 40 kHz (typical value (see Note 1) at -1.5 dB attenuation point, with filter turned off)

Measurement range/Accuracy (see Note 2) (see Note 3)

Range	Accuracy (see Note 2)	Temperature coefficient (see Note 3)
± 1 V	$\pm(0.04\%$ of rdg + 0.4 mV)	$\pm(40$ ppm of rdg + 22 μ V)/ $^{\circ}$ C
± 2 V	$\pm(0.04\%$ of rdg + 0.6 mV)	$\pm(40$ ppm of rdg + 32 μ V)/ $^{\circ}$ C
± 5 V	$\pm(0.04\%$ of rdg + 1.3 mV)	$\pm(40$ ppm of rdg + 60 μ V)/ $^{\circ}$ C
± 10 V	$\pm(0.07\%$ of rdg + 6.5 mV)	$\pm(65$ ppm of rdg + 460 μ V)/ $^{\circ}$ C
± 20 V	$\pm(0.07\%$ of rdg + 8.7 mV)	$\pm(65$ ppm of rdg + 560 μ V)/ $^{\circ}$ C
± 35 V	$\pm(0.07\%$ of rdg + 15.5 mV)	$\pm(65$ ppm of rdg + 840 μ V)/ $^{\circ}$ C

Acquisition method: Trigger, free run, gate (level), gate (edge)

Memory length of acquisition memory: 4 MWords

Memory partition (possible only when trigger mode is selected): Select from 1/2/4/8/16/32/64/128/256 partitions

Maximum record length: 1 MWord/CH (for 3 CH/4 CH measurement), 2 MWords/CH (for 2 CH measurement), 4 MWords/CH (for 1 CH measurement)

Time base source: Module's internal clock, or the time base signal (CMNCLK) of the measuring station (WE bus)

Sampling interval: 10 μ s to 10 s, 1 ms to 10 s (when in free run mode using WE7000 control software)

Trigger source: Input signal (includes input signals of other isolated digitizer modules that are linked), or the bus trigger (BUSTRG1/BUSTRG2) signal of the measuring station

Bus trigger signal (BUSTRG1/BUSTRG2) output source: Able to output the trigger detected from the input signal

Trigger level

Resolution: 10 mV at $\pm 1/2/5$ V range, 100 mV at $\pm 10/20/35$ V range (Typical value (see Note 1))

Hysteresis width: 0.5% of (upper limit of range - lower limit of range) (Typical value (see Note 1))

Measurement accuracy: 0.5% of ((upper limit of range - lower limit of range)

Trigger type: Edge trigger, state trigger, combination trigger (AND/OR of the input signals)

Amount of pre-trigger: Set in the range from 0 to the record length - 2

Connector type:

WE7271: Clamp type terminal (detachable terminal block)
Recommended stripped length of input signal cable: 7 mm
Thickness of input signal cable: 0.5 to 1.5 mm² (for twisted cable)

WE7272: Isolated BNC

Sampling skew between channels in synchronous operation (with filter turned off):

Channels in one module: Approx. 30 ns (Typical value (see Note 1))

Channels in adjacent modules: $20 \times (N - 1) + 50$ ns (Typical value (see Note 1) + module skew), where N is the number of linked modules.

General Specifications

Safety standard: Complies with CSA C22.2 No. 1010.1 and EN61010-1, conforms to JIS C1010-1

Warm-up time: At least 30 minutes

Maximum allowable input voltage: ± 50 VDC + AC peak (Overvoltage Category: CAT I and II)

Maximum common mode voltage

Between the L terminal and ground

WE7271: 250 VACrms or ± 250 VDC

WE7272: ± 42.4 VDC + AC peak

Maximum voltage across channels

WE7271: 250 VACrms or ± 250 VDC (Between any two terminals of different channels)

WE7272: ± 42.4 VDC + AC peak (Between L terminals of different channels)

Withstanding voltage

Between input terminal and ground: 60 Hz 1500 VACrms for one minute

Between channels

WE7271: 60 Hz 2300 VACrms for one minute

WE7272: 60 Hz 1500 VACrms for one minute

Insulation resistance

Between input terminal and ground and between channels: 500 VDC, 10 M Ω or higher

Operating conditions: Same as those of the measuring station

Storage conditions

Temperature: -20°C to 60°C

Humidity: 20 to 80% RH (no condensation)

Power consumption: 12 VA (Typical value (see Note 1) at 100 V/50 Hz)

External dimensions: Approx. 33{1.3} (W) \times 243{9.54} (H) \times 232{9.13} (D) mm{inch} (projections excluded)

Weight: Approx. 0.7{1.54} kg{lb}

Number of used slots: 1

Standard accessory

WE7271: Terminal block (1) (attached to the input connector at the time of shipment), User's Manual (1)

WE7272: User's Manual (1)

Note 1: Typical value represents a typical or average value. It is not strictly guaranteed.

Note 2: Ambient temperature: $23 \pm 5^{\circ}\text{C}$, Ambient humidity: $50 \pm 10\%$ RH, after the warmup time has passed

Note 3: At 5°C - 18°C or 28°C - 40°C

AVAILABLE MODEL

Model	Description
707271/HE	4-CH, 100 kS/s Isolated Digitizer Module
707272/HE	4-CH, 100 kS/s Isolated Digitizer Module

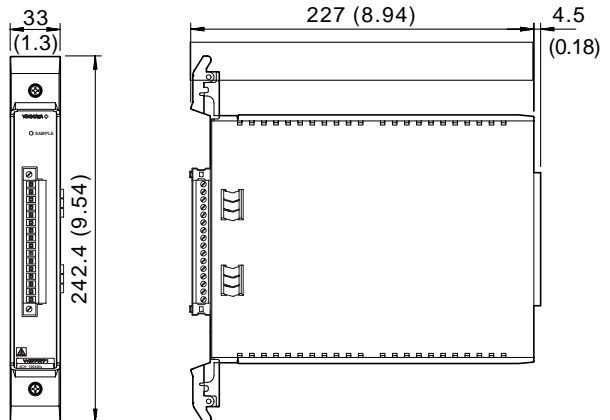
Accessory (sold separately)

Accessory	Model	Description	Order quantity
Terminal block	A1460JT	16-point Terminal	1

Dimensions

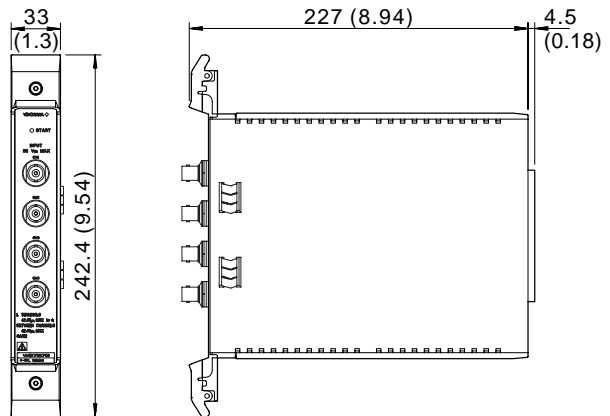
WE7271

Unit: mm (inch)



WE7272

Unit: mm (inch)



WE7275

2-CH, 1 MS/s Isolated Digitizer Module

Overview

The WE7275 2-channel 1 MS/s isolated digitizer module can convert the analog signals of 2 channels to digital signals at a maximum speed of 1 MHz. Equipped with two A/D converters, the module can sample data through two channels simultaneously at 1 MHz. The input channels are isolated from each other, as well as from the ground.

The module contains in its flash memory the graphic data for screens used to set such data items as the range and sampling rate necessary for module operation. When connected to a personal computer, the module is actuated once it transfers the graphic data to the computer. In addition, two or more modules can be mounted side by side to enable synchronous operation. The module supports the trigger function that permits you to acquire data before and after the rise of a specific event.

Features

- 1 MS/s sampling and 14-bit analog-to-digital conversion of both channels simultaneously
- Isolation between input channels and between input channels and ground
- Built-in 4MWord acquisition memory
- Operates in sync with an adjacent WE7275 module
- Trigger function that allows data immediately before and after the rise of an event, to be acquired correctly

Performance Specifications

Number of input channels: 2

Input format: Floating unbalanced input, isolation between channels and between the input and ground

Connector type: Isolated BNC

Input coupling: DC/AC

A/D resolution:

±100 mV to ±200 V range: Equivalent to 14 bits (includes the sign)

±350 V range: Equivalent to 13 bits (includes the sign)

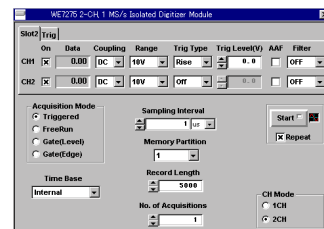
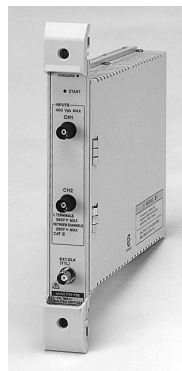
Input impedance: Approx. 1 MΩ

Maximum source resistance: 100 V or less

Frequency characteristics (−3 dB attenuation point, when filter is turned OFF):

For DC coupling: DC to 500 kHz (Typical value (see Note))

For AC coupling: 1 Hz to 500 kHz (Typical value (see Note))



WE7275

Measurement range/Accuracy (Ambient temperature: 23 ±5°C,

Ambient humidity: 50 ±10% RH, after the warm-up time has passed)

Range	Accuracy	Temperature coefficient (at 5-18°C or 28-40°C)
±100 mV	±(0.15% of rdg + 0.4 mV)	±(100 ppm of rdg + 30 μV)/°C
±200 mV	±(0.15% of rdg + 0.6 mV)	±(100 ppm of rdg + 40 μV)/°C
±500 mV	±(0.15% of rdg + 1 mV)	±(100 ppm of rdg + 60 μV)/°C
±1 V	±(0.15% of rdg + 1.7 mV)	±(100 ppm of rdg + 0.1 mV)/°C
±2 V	±(0.15% of rdg + 3.2 mV)	±(100 ppm of rdg + 0.2 mV)/°C
±5 V	±(0.15% of rdg + 8 mV)	±(100 ppm of rdg + 0.5 mV)/°C
±10 V	±(0.15% of rdg + 40 mV)	±(100 ppm of rdg + 3 mV)/°C
±20 V	±(0.15% of rdg + 60 mV)	±(100 ppm of rdg + 4 mV)/°C
±50 V	±(0.15% of rdg + 100 mV)	±(100 ppm of rdg + 6 mV)/°C
±100 V	±(0.15% of rdg + 170 mV)	±(100 ppm of rdg + 10 mV)/°C
±200 V	±(0.15% of rdg + 320 mV)	±(100 ppm of rdg + 20 mV)/°C
±350 V	±(0.15% of rdg + 800 mV)	±(100 ppm of rdg + 50 mV)/°C

Input filter:

Low-pass filter

Cut-off frequency: OFF, 100 kHz, 40 kHz, 4 kHz, 400 Hz (Typical value (see Note))

Filter characteristics: 4th order Bessel characteristics (−24 dB/oct.)

Anti-aliasing filter

Cut-off frequency: OFF, 20 Hz to 40 kHz (in steps of 1, 2, 4 and their ten-fold multiples)

Pass-band characteristics: ±1 dB at 5 to 100% of the cut-off frequency (Typical value (see Note))

Attenuation characteristics: −80 dB at frequencies greater than or equal to 2.1 times the cut-off frequency (Typical value (see Note))

Acquisition method: Trigger, free run, gate (level), gate (edge)

Memory length of acquisition memory:

2 MWord/CH (when using 2CH) or 4 MWord/CH (when using 1CH)

Memory partition (partition possible only when trigger mode is selected): Select from 1/2/4/8/16/32/64/128/256 partitions

Maximum sampling rate: 1.024 MS/s

Time base source: Module's internal clock, external clock, or the time base signal (CMNCLK) of the measuring station (WE bus)

Internal time base: 1 μ s to 1 s

Trigger source: Input signal (includes input signals of other isolated digitizer modules that are linked), or the bus trigger (BUSTRG1/BUSTRG1) signal of the measuring station

Bus trigger signal (BUSTRG1/BUSTRG2) output source: Able to output the trigger detected from the input signal

Trigger level:

Resolution: 1 mV at $\pm 100/200/500$ mV range, 10 mV at $\pm 1/2/5$ V range, 0.1 V at $\pm 10/20/50$ V range, 1 V at $\pm 100/200/350$ V range

Hysteresis width: 5% of (upper limit of range – lower limit of range) (Typical value (see Note))

Setting Accuracy: 3% of \pm (upper limit of range – lower limit of range)

Trigger type: Edge trigger, state trigger, combination trigger (AND/OR of the input signals)

Amount of pre-trigger (selectable only when trigger mode is selected): Set in the range from 0 to (the record length – 2)

External clock input:

Input format: Non-isolated unbalanced (TTL)

H level input: 2.2 V min.

L level input: 0.5 V max.

Input resistance: 10 k Ω (Typical value (see Note))

Connector type: BNC

Note: Typical value represents a typical or average value. It is not strictly guaranteed.

■ General Specifications

Safety standard: Complies with CSA C22.2 No. 1010.1 and EN61010-1, conforms to JIS C1010-1

Warm-up time: At least 30 minutes

Maximum allowable input voltage:

Analog input signal: ± 400 V (DC + ACpeak)

External clock input: -1 V to $+6$ V (Overvoltage Category: CAT I and II)

Maximum common mode voltage (between the analog signal input L terminal and ground): ± 250 VDC or 250 VACrms (when using the isolated BNC plug included in the package)

Maximum voltage across channels (between any two analog signal L terminals of different channels): ± 250 VDC or 250 VACrms

Insulation withstand voltage:

Between analog signal input L terminal and ground
1500 VAC (60 Hz) for one minute

Between analog signal input channel L terminals
2300 VAC (60 Hz) for one minute

Insulation resistance (Between analog signal input L terminal and ground and between analog input channels):
500 VDC, 10 M Ω or more

Operating conditions: Same as those of the measuring station

Storage conditions:

Temperature: -20 to 60°C

Humidity: 20 to 80% RH (no condensation)

Power consumption: 14 VA (typical value (see Note) at 100 V/50 Hz)

External dimensions: Approx. 33{1.3} (W) \times 243{9.54} (H) \times 232{9.13} (D) mm{inch} (projections excluded)

Weight: Approx. 0.8{1.76} kg{lb}

Number of used slots: 1

Standard accessories: Isolated BNC plugs (2), User's Manual (1)

Note: Typical value represents a typical or average value. It is not strictly guaranteed.

AVAILABLE MODELS

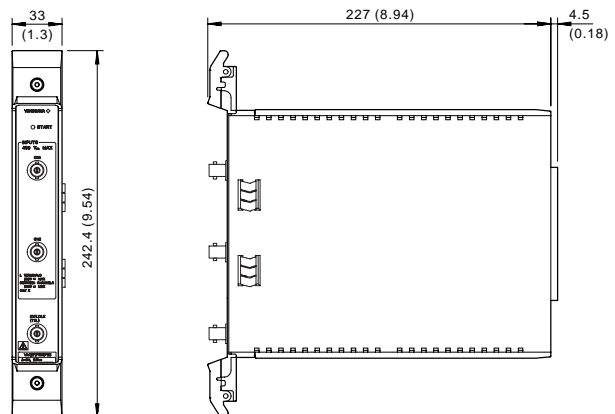
Model	Description
707275/HE	2-CH, 1 MS/s Isolated Digitizer Module

Accessories (sold separately)

Accessory	Model	Description	Order quantity
Isolated BNC plug	A1226JA		1

■ Dimensions

Unit: mm (inch)



WE7281/WE7282

4-CH, 100 kS/s D/A Module

Overview

The WE7281/WE7282 4-channel 100-kS/s D/A module can convert 4 channels' worth of digital signals to analog signals at maximum speed of 100 kHz. The output channels are isolated from each other, as well as from the ground. Not only arbitrary waveform generator, but function generator and DC output functions are available. Its flash memory contains setup information required for module operations. Setup information is transferred to the PC when the module is connected. In addition, two or three modules can be mounted side by side to enable synchronous operation.

Featured

- 100 kS/s sampling and 16-bit digital to analog conversion on all four channels simultaneously
- Isolation between outputs and between outputs and ground
- Three functional mode: Arbitrary waveform generator, function generator, DC output
- Arbitrary waveform generator:
Waveform memory 4 MWord (at 1ch)
Generate WE7251/WE7271 acquisition data and waveform Data edited by Yokogawa waveform editor
- Function generator
Linear, log, Arbitrary sweep for frequency, amplitude, both Frequency and amplitude simultaneously, duty cycle (only for pulse wave)

Performance Specifications

Number of Output Channels: 4

Output format: Floating unbalanced output, isolated between channels

D/A resolution: 16 bits (includes the sign)

Output range: ± 1 V, ± 2 V, ± 5 V, ± 10 V

Maximum output current: ± 10 mA (per channel)

Allowable load resistance: 1 k Ω or more

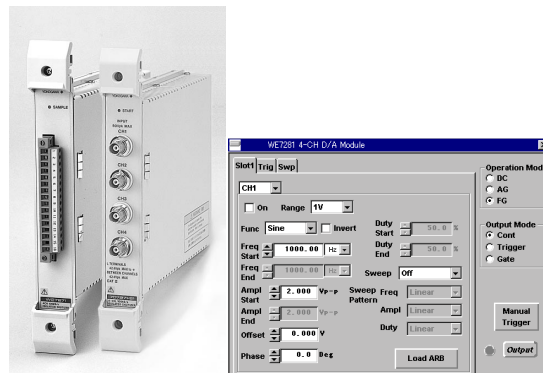
Output impedance: 1 Ω or less

During DC Output

DC accuracy

(at ambient temperature of $23 \pm 5^\circ\text{C}$, ambient humidity of $50 \pm 10\%$ RH, after the warm-up time has passed)

Range Resolution DC Accuracy		Temperature Coefficient (5-18°C, 28- 40°C)
±1 V	±(0.05% of setting + 0.5 mV)	±(50 ppm of etting + 33 μV/°C)
±2 V	±(0.05% of setting + 1 mV)	±(50 ppm of setting + 54 μV/°C)
±5 V	±(0.05% of setting + 2 mV)	±(50 ppm of setting + 116 μV/°C)
±10 V	±(0.05% of setting + 4 mV)	±(50 ppm of setting + 220 μV/°C)



WE7281/WE7282

Settling time: 32 μs (until the value settles within $\pm 0.1\%$ of the final value, typical value (see Note))

Trigger source: Manual, bus trigger signal (BUSTRG1/BUSTRG2) of the measuring station.

During Function Waveform (FG) Output

Output waveform: Sine, pulse (variable duty cycle), ramp, triangular, arbitrary, and DC.

Output frequency range and resolution: 1 mHz to 20 kHz (Sine wave), 1 mHz to 10 kHz (other waves)

Resolution: 1 mHz

Output frequency accuracy: $\pm(0.01\%$ of setting + 23 μHz)

Maximum output voltage Range: within the output range

Amplitude range and accuracy: (at ambient temperature of $23 \pm 5^\circ\text{C}$, ambient humidity of $50 \pm 10\%$ RH, after the warm-up time has passed.)

Range Setting	Selectable range	Resolution	Accuracy (for 1-kHz sine wave)	Offset Voltage/DC output Accuracy
± 1 V	0 to 2 Vp-p	0.1 mVp-p	± 4 mVp-p	± 2 mV
± 2 V	0 to 4 Vp-p	1 mVp-p	± 8 mVp-p	± 4 mV
± 5 V	0 to 10 Vp-p	1 mVp-p	± 20 mVp-p	± 10 mV
± 10 V	0 to 20 Vp-p	1 mVp-p	± 40 mVp-p	± 20 mV

Amplitude frequency characteristics (when generating maximum voltage at each range, with an offset voltage of 0 V, and measuring the rms value at 1 kHz as reference)

Sine: ≤ 20 kHz +0/-0.34 dB

Pulse: ≤ 10 kHz +0/-3.2%

Triangular: ≤ 10 kHz +0/-3.2%

Ramp: ≤ 10 kHz +0/-12.9%

Sine wave purity (when generating maximum voltage at each range, with an offset voltage of 0 V)

Harmonics (the maximum value in 2 to 5th order harmonics)

1 kHz: -55 dBc or less

10 kHz: -50 dBc or less

Suprious (frequency range of 1 kHz to 100 kHz)

1 kHz: -55 dBc or less

10 kHz: -50 dBc or less

Pulse wave characteristics (when generating maximum voltage at each range, with an offset voltage of 0 V)

Rise time: 1.2 μ s (10% to 90%, typical value (see Note))

Overshoot: Less than or equal to $\pm 0.5\%$ of the output p-p value (typical value (see Note))

Output jitter: $\pm 5 \mu$ s

Duty cycle setting

Range: 0 to 100% (resolution 0.1%)

Time accuracy: $\pm((0.01\% \text{ of } 1/\text{the output frequency}) + 5 \mu\text{s})$

Phase

Target: Start and stop phase of trigger oscillation, gate oscillation, and continuous oscillation

Range: $\pm 360^\circ$ (Resolution: 0.1°)

Output operation: Continuous, trigger, and gate

Trigger source: Manual, bus trigger signal (BUSTRG1/BUSTRG2) of the measuring station.

Gate source: Manual, bus trigger signal (BUSTRG1/BUSTRG2) of the measuring station.

Sweep function: Frequency, amplitude, both frequency and amplitude simultaneously, duty cycle (only for pulse wave)

Sweep mode: Linear, log, and arbitrary pattern

Sweep time: 1 s to 1000 s

Sweep time resolution: 1 ms

Sweep time accuracy: $\pm(0.033\% \text{ of setting})$

Bus trigger output: Output at an arbitrary phase angle of the specified channel.

Bus trigger output time accuracy: $\pm 12.5 \mu$ s

During Arbitrary Waveform (AG) Output

Maximum D/A sampling interval: 10 μ s

Sampling clock source: Internal, or the time base signal (CMNCLK) of the measuring station

Internal clock interval: 10 μ s to 10 s

Internal clock interval resolution 10 μ s

Memory length: 1 MWord/CH (at 4 CH), 2 MWord/CH (at 2CH), or 4 MWord/CH (at 1CH)

Memory partitions: 1, 2, 4, 8, 16, 32, 64, 128, or 256

Waveform pattern length: 10 to (memory length/the number of memory partitions)

Waveform output mode: Single, continuous, single by triggering, and continuous by triggering

Trigger source: Manual, bus trigger signal (BUSTRG1/BUSTRG2) of the measuring station.

Bus trigger output: Output at an arbitrary sample of the specified channel.

Bus trigger output time accuracy $\pm(\text{sampling interval} + 7.5 \mu\text{s})$

Synchronized Operation

Skew between channels Within the same module: 1.5 μ s (typical value (see Note)) Between adjacent modules: 1.6 μ s (typical value (see Note))

General Specifications

Safety standard: Complies with CSA C22.2 No. 1010.1 and EN61010-1, conforms to JIS C1010-1

Warm-up time: At least 30 minutes

Maximum Common-Mode Voltage (between L Terminal and Ground)

WE7281: ± 250 VDC or 250 VACrms

WE7282: ± 42.4 VDC + ACpeak

Maximum Voltage between Channels

WE7281: ± 250 VDC or 250 VACrms

WE7282: ± 42.4 VDC + ACpeak

Withstand Voltage

Between output terminal and ground

WE7281/WE7282: 1500 VACrms at 60 Hz for one minute

Between channels

WE7281: 2300 VACrms at 60 Hz for one minute

WE7282: 1500 VACrms at 60 Hz for one minute

Insulation Resistance (between Output Terminal and Ground and between Channels)

10 M Ω or more at 500 VDC

Output Connector

WE7281: Clamp type terminal (terminal block is detachable)

WE7282: Isolated BNC

Operating conditions: Same as those of the measuring station

Storage conditions

Storage temperature range: -20 to 60°C

Storage humidity range: 20 to 80% RH (no condensation)

Power consumption: 15VA (typical value (see Note) at 100 V/50 Hz.)

External dimensions: Approx. 33{1.30} (W) \times 243{9.57} (H) \times 232{9.13} (D) mm{inch} (projections excluded)

Weight: Approx. 0.9{1.98} kg{lb}

Number of dedicated slots: 1

Standard Operating Conditions

Standard Accessories

WE7281: Terminal block (1) (attached to the output connector at the time of shipment)

User's Manual (1)

WE7282: User's Manual (1)

Note: Typical value represents a typical or average value. It is not strictly guaranteed.

AVAILABLE MODELS

Model	Description
707281/HE	4-CH, 100 kS/s D/A Module
707282/HE	4-CH, 100 kS/s D/A Module

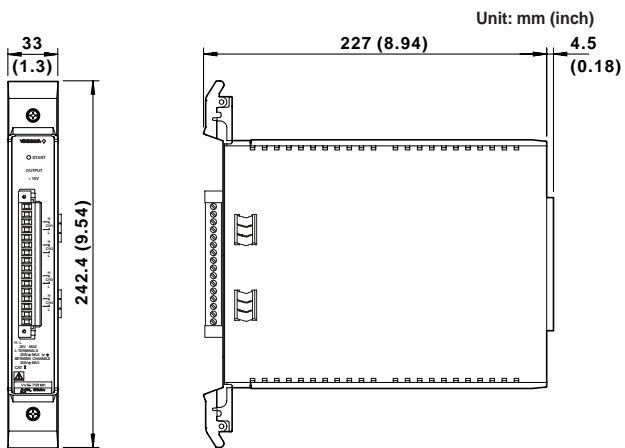
Special Accessories (sold separately)

WE7281:

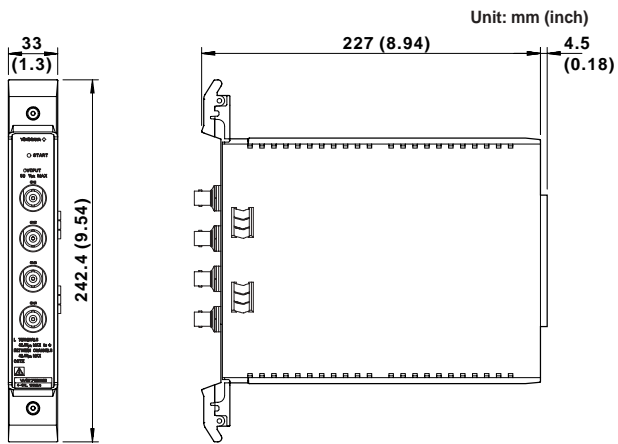
Accessory	Model	Description	Order quantity
Terminal block	A1460JT	16PT Terminal	1

■ Dimensions

WE7281:



WE7282:



WE7311

1 GS/s Digital Oscilloscope Module

■ Overview

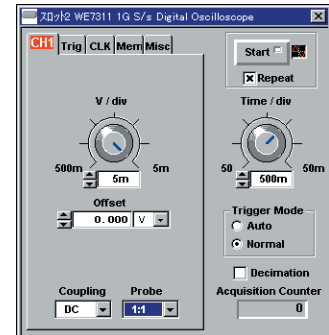
This module contains a digital oscilloscope and digitizer with a range of basic functions. Its flash memory contains setup information required for module operations, such as ranges, time axes, and triggers. The setup information is transferred to the PC when the module is connected.

■ Features

- 1 GS/s, A/D 8-bit resolution
- 400 MHz analog bandwidth (real time samples only)
- 2MWord memory
- Sequential store
- Synchronized operations between adjacent WE7311 modules

■ Standard Specifications

- Measurement input section
 - Number of Input Channels: 1
 - Input Coupling: DC (1 M/50 Ω), AC (1 M/50 Ω), GND
 - Connector Type: BNC
 - Input Impedance: 1 M Ω \pm 1% (approx. 10 pF) or 50 Ω \pm 1%
 - Input Voltage Range: During oscilloscope mode: 5 mV/div to 500 mV/div (in 1-2-5 steps) During digitizer mode: \pm 25 mV to \pm 2.5 V range (in 1-2.5-5 steps)
 - Vertical Resolution: 8 bits
 - Maximum Input Voltage: When the input impedance is 1 M Ω \pm 42 V (DC + peak AC < 10 kHz) When the input impedance is 50 Ω \pm 5 VDC (500 mW) or 5 Vrms (see Note 1) Overvoltage Category CAT I and II
 - Frequency Characteristics (see Note 2) (see Note 3): For 10 mV/div to 500 mV/div or \pm 50 mV to \pm 2.5 V range: DC to 400 MHz. For 5 mV/div or \pm 25 mV range: DC to 250 MHz –3dB point in the low frequency region during AC coupling: 10 Hz or less
 - Voltage Axis DC Accuracy (see Note 2): \pm (2% of input voltage range (full scale) + offset voltage accuracy)
 - DC Offset Setting Range:
 - For 5 mV/div to 50 mV/div or \pm 25 mV to \pm 250 mV range: \pm 2 V (0.1 mV resolution).
 - For 100 mV/div to 500 mV/div or \pm 500 mV to \pm 2.5 V range: \pm 20 V (1 mV resolution)
 - Offset Voltage Accuracy (see Note 2):
 - For 5 mV/div to 50 mV/div or \pm 25 mV to \pm 250 mV range: \pm (1% of the specified value + 1 mV).
 - For 100 mV/div to 500 mV/div or \pm 500 mV to \pm 2.5 V range: \pm (1% of the specified value + 10 mV)



WE7311

Residual Noise Level:

For 5 mV/div to 50 mV/div or \pm 25 mV to \pm 250 mV range: \pm 2.0 mV or \pm 2 LSB, whichever is larger (typical value (see Note 4)).

For 100 mV/div to 500 mV/div or \pm 500 mV to \pm 2.5 V range: \pm 20 mV or \pm 2 LSB, whichever is larger (typical value (see Note 4))

Significant Bits

>6.5 bits (DC-50 MHz) (typical value (see Note 4))

>6.0 bits (50 MHz-100 MHz) (typical value (see Note 4))

Skew between Modules (see Note 5): Within 1 sampling interval (typical value (see Note 4))

Isolation between Channels (see Note 5): –40 dB@100 MHz (typical value (see Note 4) in the same range)

• Trigger Mode

NORMAL: Acquire the waveform only when a trigger occurs.

AUTO: Automatically acquire the waveform if the trigger does not occur for a prescribed time period.

Trigger Source: Input signal (includes input signal from linked WE7311 modules), external input (EXT IN), and bus trigger (BUSTRG1/BUSTRG2) signal of the WE bus

Trigger Coupling: DC, LF Rejection (approx. 50 kHz)

Trigger Type: Edge

Trigger Slope: Rising edge or falling edge

Trigger Level Setting Range: Within the input voltage range (when using DC coupling, 0.5% resolution)

- Trigger Sensitivity:
 DC to 1 MHz: 10% of the input voltage range (full scale)
 DC to 300 MHz: 20% of the input voltage range (full scale)
 DC to 400 MHz: 70% of the input voltage range (full scale)
- Trigger Level Accuracy (see Note 1)
 $\pm 5\%$ of the input voltage range (full scale)
- Trigger Position (During the Oscilloscope Mode):
 ± 5 div
- Pretrigger (During the Digitizer Mode): 0 to 100% of the acquisition sample
- Trigger Delay: During the oscilloscope mode: 0 up to 300 s
 During the digitizer mode: 0 to 200 M samples (however, the maximum value is the value corresponding to 300 s when converted into delay time)
- Trigger Output Able to output the acquisition trigger to the trigger bus (BUSTRG1/BUSTRG2) of the WE bus.
- Output Trigger Input Impedance (see Note 2): 1 M Ω or 50 Ω
- External Trigger Input Frequency Bandwidth (see Note 2):
 DC to 400 MHz (minimum voltage: 3 V_{p-p})
- External Trigger Input Voltage Range (see Note 2): ± 4 V
- External Trigger Level Setting Range: ± 4 V (0.1 V resolution)
- The external trigger input and external clock input share the same connector.
- Time Axis

Time Axis Setting Range (During Oscilloscope Mode)
 10 ns/div to 50 s/div (in 1-2-5 steps)

Sampling Interval (During the Digitizer Mode)
 1 ns to 10 ms (in 1-2-5 steps) (For API, 1-2-2.5-4-5 steps)

Time Axis Accuracy (see Note 1): $\pm(25 \text{ ppm} + 1 \text{ sampling interval})$

External Clock Input/Output (see Note 2): Able to input an external input signal (EXT IN) as a sampling clock. Able to input an external input signal (EXT IN) or the time base (CMNCLK) signal of the WE bus as a reference clock. Able to output the 10-MHz internal reference clock to the time base (CMNCLK) of the WE bus.

External Clock Input Impedance: 1 M Ω or 50 Ω

External Clock Input Voltage Range: ± 4 V

External Clock Input Threshold: ± 2 V (0.1 V resolution)

External Sampling Clock Input: Frequency Range /
 Minimum Voltage: 10 MHz to 500 MHz / 3 V_{p-p}

External Reference Clock Input Frequency Range/
 Minimum Voltage: 10 MHz/800 mV_{p-p}
 - Functions

Record Length: 100 to 2 MWord (1 Word unit, 1,000,001 words or more are only for single acquisition)

Sequential Store: Memory partition (1 to 4096, 2ⁿ steps), store count can be specified.

Auto Setup: Automatically sets the voltage axis, time axis, trigger level, etc.

Calibration: Auto calibration and manual calibration available

General Specifications

- Standard operating conditions
 Ambient temperature: $23 \pm 2^\circ\text{C}$
 Ambient humidity: $50 \pm 10\%$ RH
 Warm-up time: Minimum 30 minutes
 Operating conditions: Same as that of the measuring station
- Storage conditions
 Storage temperature range: -20 to 60°C
 Storage humidity range: 20 to 80% RH (no condensation)
- Power consumption: 18 VA (typical value (see Note 4) at 100 V/50 Hz,
- External dimensions: Approx. 33{1.30} (W) \times 243{9.57} (H) \times 232{9.13} (D) mm{inch} (projection excluded)
- Weight: Approx. 0.8{1.76} kg{lb}
- Number of dedicated slots: 1
- Accessories: Module link connector (1 set),
 User's Manual (1)
- Note 1: When overvoltage is applied, the protective circuit is activated, and the input coupling is switched to GND.
- Note 2: Value measured with the time base set to internal clock under standard operating conditions after warm-up time has elapsed and after calibration.
- Note 3: The -3 dB point when the input coupling is set to DC 50 Ω with a 100-kHz sine wave with an amplitude corresponding to ± 3 divisions used as a reference.
- Note 4: Typical value represents a typical or average value. It is not strictly guaranteed.
- Note 5: Measured using the same range with the time base set to internal clock under linked operation

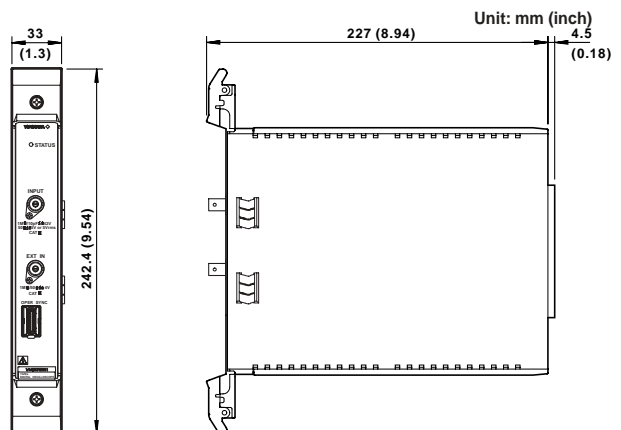
AVAILABLE MODELS

Model	Description
707311/HE	1 GS/s Digital Oscilloscope Module

Special Accessories (sold separately)

Accessory	Model	Description	Order quantity
Module link connector	B9952RB		1
Passive probe	700944	10 : 1 10 M Ω 300 MHz Bandwidth	1

Dimensions



WE7521

4-CH Timing Measurement Module

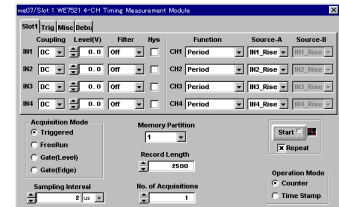
Overview

The WE7521 is a 4-channel counter module.

It can measure one of five parameters (period, time interval, totalize count, up and down count, and frequency ratio) of four input signals.

The measured values are written to the acquisition memory every specified sampling interval.

In addition, the WE7521 includes a "time stamp mode" in which the time is recorded when any of the four input signals change.



WE7521

Features

- Arbitrarily combine 4 channels of input, and perform measurement on one of five parameters (period, time interval, totalize count, up and down count, and frequency ratio)
- Store up to 1 Mpoints of measured data continuously (up to 4 Mpoints in time stamp mode)
- 5 ns time resolution, maximum sampling frequency of 500 kSps (in counter mode)

Performance Specifications

Number of Inputs: 4
 Input Format: Non-isolated, unbalanced
 Connector Type: BNC
 Input Coupling: DC/AC
 –3 dB Point During AC Coupling: 10 Hz (Typical value (see Note 1))
 Input Threshold Level: Set in the range ± 20 V (0.1 V resolution) for each input
 Threshold Level Accuracy: $\pm 5\%$ of the specified value + 150 mV)
 Input Impedance: $1\text{ M}\Omega \pm 1\%$
 Input Filter: OFF/100kHz/10kHz/1kHz (–3 dB point) (Typical value (see Note 1))
 Input Sensitivity: When hysteresis width is NORMAL and frequency is 1 MHz or less: 1.0 Vpp (Typical value (see Note 1))
 When hysteresis width is WIDE and frequency is 1 MHz or less: 3.0 Vpp (Typical value (see Note 1))
 Hysteresis Width: NORMAL/WIDE
 Hysteresis Direction: Center/Upper/Lower (common to all inputs)
 Maximum Input Voltage: ± 42.4 V (DC + ACpeak) (Overvoltage Category CAT I and II)

Specifications for the Counter Mode

Number of Counters: 4
 Measurement Slope: Rising edge or falling edge
 Measurement Function: Period, time interval, totalize count, up and down count, and frequency ratio
 Display Resolution: During period/time interval

measurement: 5 ns

Minimum Input Pulse Width: 50 ns

Minimum Input Edge Interval: For all input edges during up and down count: 50 ns

Data Width: During period/time interval measurement: 32 bits

During totalize count/up and down count/frequency ratio measurement: 29 bits (see Note 2)

Acquisition Mode: Trigger, free run, gate (level), gate (edge)
 Specifications for Each Measurement Function

a) Period

Measurement range: 100 ns to 20 s (see Note 3)

Resolution: $(5\text{ ns} \pm \sqrt{2} \times \text{trigger error})$

Accuracy: Resolution \pm (time base aging 3 sampling interval) ± 5 ns

b) Time interval

Measurement range: 100 ns to 20 s (see Note 3)

Resolution: $(\pm 5\text{ ns} \pm \text{input A trigger error} \pm \text{input B trigger error})$

Accuracy: Resolution \pm (time base aging 3 sampling interval) \pm trigger level timing error ± 5 ns

c) Totalize count

Counting capacity: 0 to 536,870,911 (see Note 3)

Counting control: Through measurement start/stop or gate (pulse) using the input signal

Counting error: ± 1 count (when the counter is controlled through measurement start/stop)

$\pm 1\text{ count} \pm \frac{(\text{input B trigger error [rising]} \pm \text{input B trigger error [falling]})}{\text{input A period}}$

(When controlled using gate/input A: signal to be measured, input B: gate signal)

d) Up and down count

Counting capacity: –268,435,456 to 268,435,455 (see Note 4)

Counting control: Through measurement start/stop or reset (Z phase) using the input signal

Counting error: ± 1 count (when the counter is controlled through measurement start/stop)

$$\pm 1 \text{ count} \pm \frac{\text{input B trigger error} \times N}{\text{input A period}} \quad (N=1, 2, 4)$$

(When controlled using reset/input A: signal to be measured, input B: reset signal)

Multiplication: $\times 1$, $\times 2$, and $\times 4$

e) Frequency ratio

Counting capacity: 0 to 536,870,911 when multiplying factor is 1, 0 to 33,554,431.9 when multiplying factor is 16, 0 to 4,194,303.99 when multiplying factor is 128, 0 to 524,287.999 when multiplying factor is 1024 (see Note 3)

Counting control: Measurement start/stop

$$\text{Counting error: } \pm 1 \text{ count} \pm \frac{\sqrt{2} \times \text{input B trigger error}}{\text{input A period} \times N} \quad (N=1, 16, 128, 1024)$$

Multiplication: 1, 16, 128, and 1024

Acquisition Memory

Maximum record length: 1 Mpoint/CH

Memory partition: 1, 2, 4, 8, 16, 32, 64, 128, and 256 (only during trigger mode)

Sampling interval: 2 μ s to 10s

Sampling signal source: Internal time base, bus clock, and input signal

Trigger source: Input signal, measured value, bus trigger signal of the measuring station

Hold off: Record length to 1,048,576 points (trigger mode), 1 to 1,048,576 points (gate (edge) mode)

Data hold function: Hold previous value or Update on new value (see Note 5)

Specifications for the Time Stamp Mode

Number of Inputs: 4

Measurement Slope: Rising edge, falling edge, and both

Maximum Measurement Time: Approximately 360 hours ($5 \times 248 \text{ ns}$)

Display Resolution: 5 ns

Resolution: $(\pm 5 \text{ ns} \pm \sqrt{2} \times \text{trigger error})$

Accuracy: Resolution \pm (time base aging \times sampling interval) $\pm 5 \text{ ns}$

Minimum Pulse Width: 200 ns

Data Format: 32 bits (24-bit time stamp data + 8-bit input edge data)

Acquisition Mode: Free run only (see Note 6)

Record Length: 4 Mpoints

Reference Time Axis Accuracy

Frequency Stability

Aging: $\pm 1.5 \times 10^{-6}$ /year

Temperature Characteristics

$\pm 2.0 \times 10^{-6}$ (5°C to 40°C)

Note 1: Typical value represents a typical or average value. It is not strictly guaranteed.

Note 2: The measured data length is 29 bits, but the data width is expanded to 32 bits.

Note 3: When the measurement range is exceeded, the data is set to invalid value.

Note 4: When the measurement range is exceeded, the data returns to the minimum (maximum) value of the counting capacity and continues the measurement.

Note 5: You can select a mode in which the previous value is held or a mode in which an invalid value is held when there is no input change during the sampling interval.

Note 6: If the rate of change of input is too fast and the data cannot be saved, the measurement is stopped.

General Specifications

Safety Standard: Complies with CSA C22.2 No. 1010.1 and EN61010-1, conforms to JIS C1010-1

Warm-Up Time: At least 30 minutes

Operating Conditions: Same as those of the measuring station

Storage Conditions

Temperature: -20°C to 60°C

Humidity: 20% to 80% RH (no condensation)

Power Consumption: 8 VA (typical value (see Note) at 100 V/50 Hz)

External dimensions: Approx. 33{1.3}(W) \times 243{9.54}(H) \times 232{9.13}(D) mm{inch} (projections excluded)

Weight: Approx. 0.7{1.54} kg{lb}

Number of Used Slots: 1

Standard Accessories: User's manual (this manual) (1)

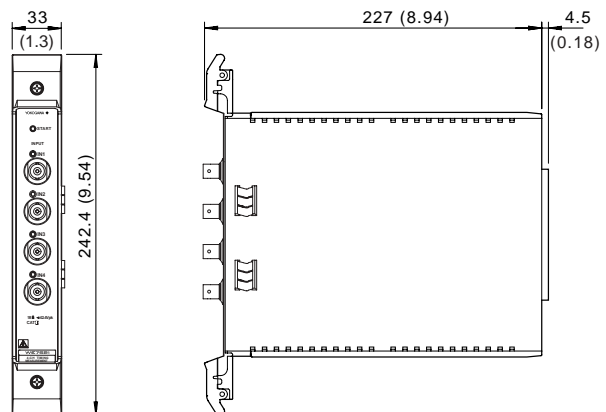
Note Typical value represents a typical or average value. It is not strictly guaranteed.

AVAILABLE MODELS

Model	Description
707521/HE	4-CH Timing Measurement Module

Dimensions

Unit: mm(inch)



707821

Input Terminal Block

■ Overview

The 707821 input terminal block is used for signal input in combination with the WE7241 digital thermometer module or the WE7251 digitizer module. It can be used to measure temperatures and voltages when combined with the WE7241 digital thermometer module.

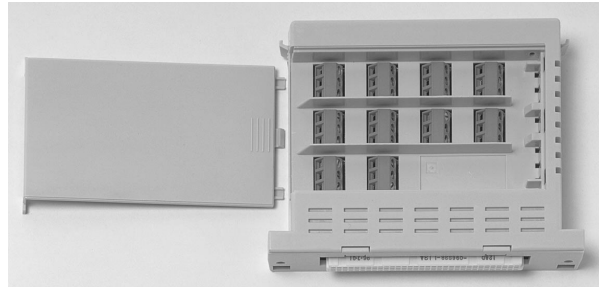
■ Features

- 10-channel input
- Independent H, L and G on each channel

■ Specifications

- Number of input channels: 10 (independent H, L and G on each channel)
- Input type: Each input channel is floating (see Note).
- Temperature measurement element: Platinum temperature measuring resistor, 100 Ω , Class A
- Standard operating conditions
Temperature: -10 to 60°C
Humidity: 20 to 80% RH
(maximum wet-bulb temperature of 29°C ; no condensation)
- Storage conditions
Temperature: -20 to 60°C
Humidity: 20 to 80% RH
- Maximum allowable input voltage (see Note): 30 VACrms, 42.4 Vpeak or ± 60 VDC (Overvoltage categories: CAT I and CAT II)
- Maximum interchannel voltage (see Note): 60 VACrms or ± 100 VDC
- Maximum allowable input current (see Note): 0.3 A
- Insulating withstand voltage
Between input terminals and between input terminal and ground: 60 Hz, 1500 VACrms for one minute
- Insulating resistance (see Note):
Between input terminals and between input terminal and ground: 500 VDC, 10 M Ω or greater
- Connectable cable diameter: 0.14{0.01} to 1.38{0.05} mm{inch}
- Recommended line length: 6{0.23} mm{inch}
- Connectable modules:
707241 (10-channel digital thermometer module)
707251 (10-channel 100 kS/s digitizer module)
- External dimensions: Approx. 29{1.14} (W) \times 135{5.31} (H) \times 103{4.06} (D) mm{inch} (projections excluded)
- Weight: Approx. 0.22{0.48} kg{lb}

Note: These specifications are for the input terminal block by itself. In practice, the specifications of the connected measurement module will be followed.



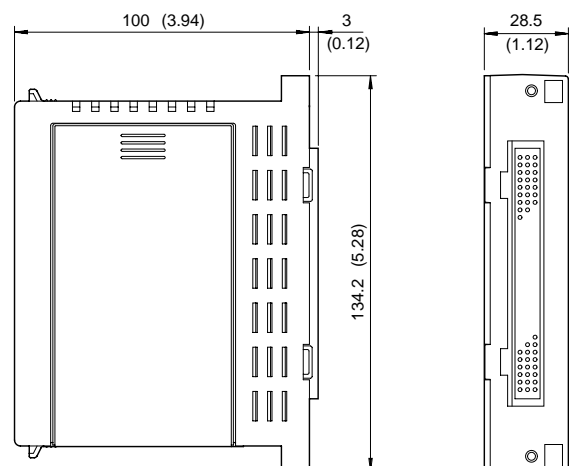
707821

AVAILABLE MODEL

Accessory	Model	Specifications	Order quantity
Input Terminal Block	707821	Temperature and voltage measurement	1

■ Dimensions

Unit: mm (inch)



707823

16-Bit Digital Input Terminal Box

■ Overview

The 707823 16-bit digital input terminal box is used in combination with a WE7262 32-bit digital I/O module. It converts an external contact signal, as well as a voltage signal ranging up to ± 35 V, into a TTL signal to feed it to the WE7262 module.

A maximum of two 707823 digital input terminal boxes can be connected to each WE7262 module, where each box is powered by the module via cable.

■ Features

- Couples a 16-bit contact signal or voltage signal with the WE7262 module.
- Compatible with voltage signals ranging up to ± 35 V.
- Allows the input threshold level to be selected from 2 and 6 V by wiring.
- Isolation among binary-digit inputs and between each input terminal and the WE7262 module

■ Specifications

Number of input points: 16 (16 bits)

Input voltage

- H level: $+2.5$ V to $+35$ V (between H1 and L), or $+8$ V to $+35$ V (between H2 and L)
- L level: -35 V to $+1$ V (between H1 and L), or -35 V to $+5$ V (between H2 and L)

Input current

- H level: $+1$ mA to $+8$ mA
- L level: 10 μ A or below

Response time: 100 μ s (Typical value (see Note))

Input format: Each bit is isolated from casing, WE7262 module, and each other.

■ General Specifications

Safety standard: Complies with CSA C22.2 No. 1010.1 and EN61010-1, conforms to JIS C1010-1

Maximum allowable input voltage

- Between H1 and L, or H2 and L: (35 VDC + AC peak (Overvoltage Category: CAT I and II. Pollution degree: 1 and 2)

Maximum common mode voltage

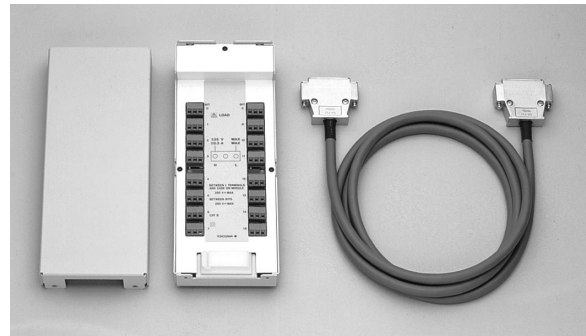
- Between input terminal and WE7262: ± 250 VDC or 250 VACrms

- Between input terminal and casing: ± 250 VDC or 250 VACrms

- Between input terminals: ± 250 VDC or 250 VACrms

Withstanding voltage

- Between input terminal and WE7262: 2300 VACrms for one minute
- Between input terminal and casing: 2300 VACrms for one minute
- Between input terminals: 2300 VACrms for one minute



707823

Operating conditions

Temperature: 5°C to 40°C

Humidity: 20 to 80% RH (no condensation)

Storage conditions

Temperature: -20°C to 60°C

Humidity: 20 to 80% RH

Diameter of cable that can be connected: 0.14 mm to 1.38 mm

Recommended stripped length of cable: 6 mm maximum

Connectable module:

WE7262 (Model: 707262) 32-bit digital I/O module

Maximum power consumption: 0.1 W

External dimensions: Approx. 97{3.8} (W) \times 42{1.7} (H) \times 234{9.2} (D) mm{inch} (projections excluded)

Weight

Main unit: Approx. 0.5{1.1} kg{lb}

Cable: Approx. 0.3{0.66} kg{lb}

Standard accessory: Shielded cable (1) (for connection between 707823 and 707262, 2 m), User's Manual (1)

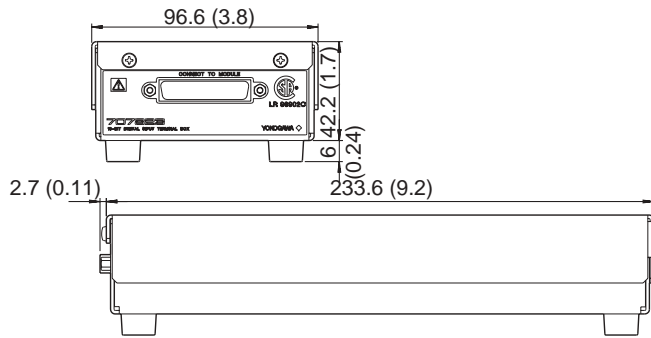
Note Typical value represents a typical or average value. It is not strictly guaranteed.

AVAILABLE MODEL

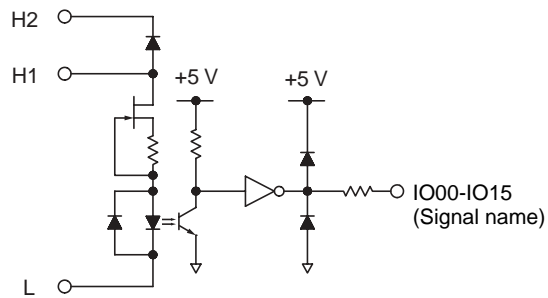
Description	Model	Specifications	Order quantity
16-bit Digital Input Terminal Box	707823	For WE7262 contact input	1

■ Dimensions

Unit: mm (inch)



I/O Circuit Diagram



707824

16-Bit Digital Output Terminal Box

■ Overview

The 707824 16-bit digital output terminal box is used in combination with the WE7262 32-bit digital I/O module. It converts the CMOS-level output of the WE7262 module to contact signals to feed them to external equipment.

A maximum of two 707824 digital output terminal boxes can be connected to each WE7262 module, where each box is powered by the module via cable.

■ Features

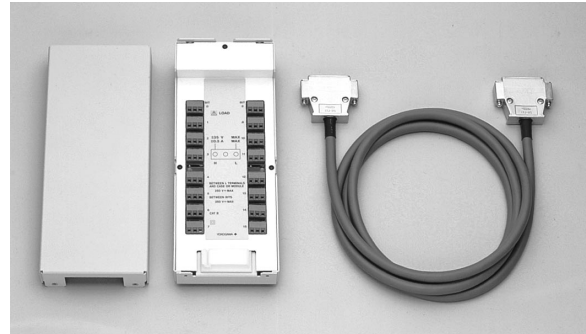
- 16-bit MOS-level contact output
- 35-V/0.3-A output capacity
- Isolation among binary-digit outputs and between each output terminal and the WE7262 module

■ Performance Specifications

Number of output points: 16 (16 bits)
 Maximum applicable voltage (with the power turned off):
 ± 35 V
 Maximum output contact current: ± 300 mA
 Turn-on resistance: $4\ \Omega$ or below
 Leakage current (with the power turned off): $100\ \mu\text{A}$ or below
 Response time: 3 ms (Typical value (see Note))
 Output format: MOS-level contact output
 Each bit is isolated from casing, WE7262 module, and each other.

■ General Specifications

Safety standard: Complies with CSA C22.2 No. 1010.1 and EN61010-1, conforms to JIS C1010-1
 Maximum common mode voltage
 Between input terminal and WE7262: ± 250 VDC or 250 VACrms
 Between input terminal and casing: ± 250 VDC or 250 VACrms
 Between input terminals: ± 250 VDC or 250 VACrms
 Withstanding voltage
 Between input terminal and WE7262: 2300 VACrms for one minute
 Between input terminal and casing: 2300 VACrms for one minute
 Between input terminals: 2300 VACrms for one minute
 Operating conditions
 Temperature: 5°C to 40°C
 Humidity: 20 to 80% RH (no condensation)
 Storage conditions
 Temperature: -20°C to 60°C
 Humidity: 20 to 80% RH
 Protection: Protection against overvoltage (each output is protected with a fuse)



707824

Diameter of cable that can be connected: 0.14 mm to 1.38 mm

Recommended stripped length of cable: 6 mm maximum
 Connectable module:

WE7262 (Model: 707262) 32-bit digital I/O module

Maximum power consumption: 1 W

External dimensions: Approx. 97{3.8} (W) \times 42{1.7} (H) \times 234{9.2} (D) mm{inch} (projections excluded)

Weight

Main unit: Approx. 0.5{1.1} kg{lb}

Cable: Approx. 0.3{0.66} kg{lb}

Standard accessory: Shielded cable (1) (for connection between 707824 and 707262, 2 m), User's Manual (1)

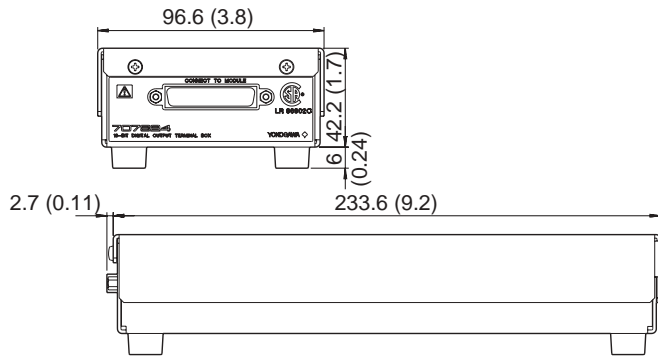
Note Typical value represents a typical or average value. It is not strictly guaranteed.

AVAILABLE MODEL

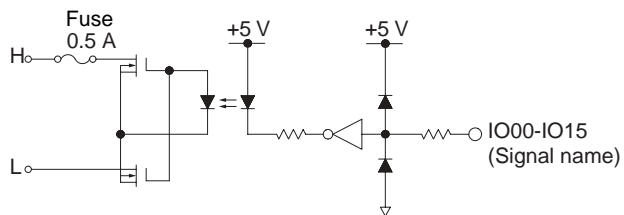
Description	Model	Specifications	Order quantity
16-bit Digital Output Terminal Box	707824	For WE7262 contact output	1

■ Dimensions

Unit: mm (inch)



I/O Circuit Diagram



7078 31/7078 32/7078 33/7078 34

Optical Fiber Cables

■ Overview

These optical fiber cables are connected with the optical interface modules and optical interface cards.

■ Features

- These multi-mode optical fiber cables have dual SC connectors for easy setup.

■ Specifications

- Cable lengths:
7078 31: 2 meters (6.56 ft)
7078 32: 5 meters (16.4 ft)
7078 33: 10 meters (32.8 ft)
7078 34: 1 meter (3.28 ft)
- Fiber optic core diameter: 62.5 (50) μm
- Clad diameter: 125 μm
- Core noncircularity: Maximum 6%
- Clad noncircularity: Maximum 2%
- Core/clad eccentricity: Maximum 6%
- Numerical aperture (NA): 0.275 \pm 0.03
- Buffer layer: Silicon resin
- Coating: Polyamide resin (external diameter: 0.9 \pm 0.1)
- Protective coating: 1.2 core fiber optic cord (consisting of a fiber-optic core covered with a PVC jacket)
- Jacket material: PVC (light green), 2.8{0.11} \times 5.6{0.22} mm{inch}
- Weight: Approx. 14 kg/km
- Minimum bending radius
When extended: 60{2.36} mm{inch} (short-radius direction only)
When fixed: 30{1.18} mm{inch} (short-radius direction only)
- Allowable instantaneous tensile stress: 196N



7078 34

AVAILABLE MODEL

Model	Description
7078 31	Optical Fiber Cable, 2 meters
7078 32	Optical Fiber Cable, 5 meters
7078 33	Optical Fiber Cable, 10 meters
7078 34	Optical Fiber Cable, 1 meter